LOGSAP 746-1

US ARMY MATERIEL COMMAND
LOGISTICS SUPPORT ACTIVITY
PACKAGING, STORAGE, AND CONTAINERIZATION CENTER

Packaging - The Basics

An Army guide for Soldiers and civilians
The bottom line is to preserve it and pack it right!

Packaging - The Basics should be used as a quick guide for basic preservation, packing, and packaging. Other additional information should be used in conjunction with this guide.

1 August 2011

Approved for public release; distribution is unlimited.

Foreword

This document was prepared as a guide for all Soldiers and civilians involved in the packaging of national stock and retrograde materiel. The information contained in this document is derived from the most current government packaging documents at the time of publication. Noted documents and websites may change without notification.

When it comes to packaging materials and publications, other sources will be key to getting the job done right the first time. In some instances, you may be engaged in the packaging of certain items on an ongoing basis; this may require comprehensive knowledge and expertise of a specific type of container or performance of a specific process such as foam-in-place (FIP). These operations often require that applicable specifications/ standards be "On Hand" for reference to make sure you do the job correctly. You can find the standard/specification number you need by accessing the Document Automation and Production Service (DAPS) through the ASSIST web site https://assist.daps.dla.mil/quicksearch/.

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IT IS HARD TO RESIST... PACKAGING

MIL-STD-2073-1
DoD STANDARD PRACTICE FOR MILITARY PACKAGING

This document outlines standard processes for the development and documentation of military packaging, as distinct from commercial packaging. This standard covers methods of preservation to protect materiel against environmentally induced corrosion and deterioration, physical and mechanical damage, and other forms of degradation during storage, multiple handling, and shipment associated with the military distribution

SB 746-1
PUBLICATIONS FOR PACKAGING ARMY GENERAL SUPPLIES
This bulletin lists related publications pertinent to the packaging and processing of Army general supplies (AR 700-15 and AR 746-1). It is intended for the guidance and use of personnel engaged in the procurement, storage, handling, shipment, issue, and care and preservation of general supplies. Publications that are pertinent to maintenance and/or ammunition are not included in this bulletin.

MIL-HDBK-773
ELECTROSTATIC DISCHARGE (ESD) - PROTECTIVE PACKAGING
Provides detailed guidance for DoD personnel who use, handle, package, or store ESD items. It is designed to promote the use of standardized packaging materials as well as promote an understanding of the ESD

FM 38-700
PACKAGING OF MATERIEL, PRESERVATION
Applications and instructions on cleaning, drying, preserving, packing, blocking and bracing, cushioning, reinforcing, weatherproofing, and marking to prepare materiel for shipment and storage.

FM 38-701
PACKAGING OF MATERIEL, PACKING
This manual emphasizes the importance of packing of military supplies and equipment. It contains detailed information concerning the requirements to accomplish packing operations. The requirements include: use of exterior shipping containers; the assembling of items or packs into the container; anchoring, blocking, bracing, and cushioning of items or packages within the container; weatherproofing; strapping of containers; the testing of exterior packs; palletization and unitization of loads; parcel post; and related subject matter. General exterior marking in accordance with MIL-STD-129 is also discussed.

AR 735-11-2
REPORTING OF SUPPLY DISCREPANCIES (SF 364)
This document provides procedures governing the methods and conditions under which shipping (item) discrepancies and packaging discrepancies, collectively referred to as supply discrepancies, are reported and replies furnished. The purpose of preparing supply discrepancy reports is to determine the cause of discrepancies, effect corrective action, and prevent recurrence.

DA PAM 700-32
PACKAGING OF ARMY MATERIEL
This publication provides uniform guidelines for packaging within the US Army.

TM 746-10
GENERAL PACKAGING INSTRUCTIONS FOR FIELD UNITS
This manual covers the general processes and procedures to be followed for the proper packaging of serviceable retrograde materiel, unserviceable economically reportable retrograde materiel, serviceable and unserviceable materiel to be repaired and recycled, and automatic return items.

MIL-STD-129
MILITARY MARKING FOR SHIPMENT AND STORAGE
This standard provides the minimum requirements for uniform military marking and procedures for their application. It is intended for use only for the application of military specific markings to items intended for transportation and storage within the military distribution system, i.e., for marking of materiel not intended for immediate use, and material that is stored and/or moved within or between DoD facilities. Markings for commercial packaging are discussed in ASTM D 3951.

MIL-STD-147
PALLETIZED UNIT LOAD
This standard establishes the methods, materials, and techniques to be employed in the formation of bonded palletized unit loads of military supplies, which are adaptable to unit loading. The methods prescribed herein are to be utilized with standard, general purpose, 40- by 48-inch pallets conforming to the various classes, types, and styles in ANSI MH1, Part 9. However, the various methods of bonding and types of stability dunnage may be modified for use with other size pallets.

ARs/DA PAMs/TMs/SBs/FMs can be found at ARMY PUBS:
http://armypubs.army.mil/

MIL-STDs/MIL-HDBKs can be found at ASSIST:
https://assist.daps.dla.mil/quicksearch/

Where to Find Item Packaging Data

Military packaging requirements for Army-owned and managed items are located in Logistics Information Warehouse (LIW) or Federal Logistics System (FEDLOG).

LIW is available at https://liw.logsa.army.mil/ and requires a CAC and system access request.

FEDLOG requires a subscription and should be installed on a computer within your work area (for information on subscriptions or updates go to http://www.dlis.dla.mil/fedlog/). FEDLOG is also available through LIW.
NOTE: If LIW is available at your work site, check LIW first for packaging requirements prior to checking FEDLOG.

QUICK steps to finding packaging requirements:
In LIW:
1. Click on "Catalog".
2. Click on "Packaging Requirements".
3. Enter NIIN and click on "Submit" (NIIN is NSN minus first four digits).
4. Check for packaging data: Pres Meth, Cl/Dr, ...etc, or SPI (Special Packaging Instructions).
5. If a SPI is listed, click "View SPI" and follow the links/instructions to retrieve SPI.
6. If no packaging data (or insufficient packaging data) is available in LIW, check FEDLOG.

In FEDLOG:
1. Select "Search Interactive".
2. Click on "ARMY" tab.
3. Enter NIIN or NSN in NIIN field (NIIN is NSN minus first four digits).
4. Select "Search".
5. Click on "Army Packaging" tab.
6. Check for packaging data: MOP, CLNG DRYING, ...etc, or SPI NO (Special Packaging Instructions Number)
7. If a SPI NO is listed, go to LIW to retrieve SPI or contact item manager to request SPI.
8. If no packaging information or SPI is in "Army Packaging", click on "FLIS Packaging" tab.
9. If no packaging information is available in FEDLOG or in LIW, contact the packaging commodity POC to request instruction on packaging the NSN. You can find the packaging commodity POC using "Packaging Help for all Commodities" link on the Packing Requirements page in LIW (Figure 1).

Where to Find Item Packaging Data: LIW

Log into LIW at : https://liw.logsa.army.mil/

At the home screen, Click on “Catalog” then click on “Packaging Requirements” to get to the “Packaging Requirements” screen (Figure 1):

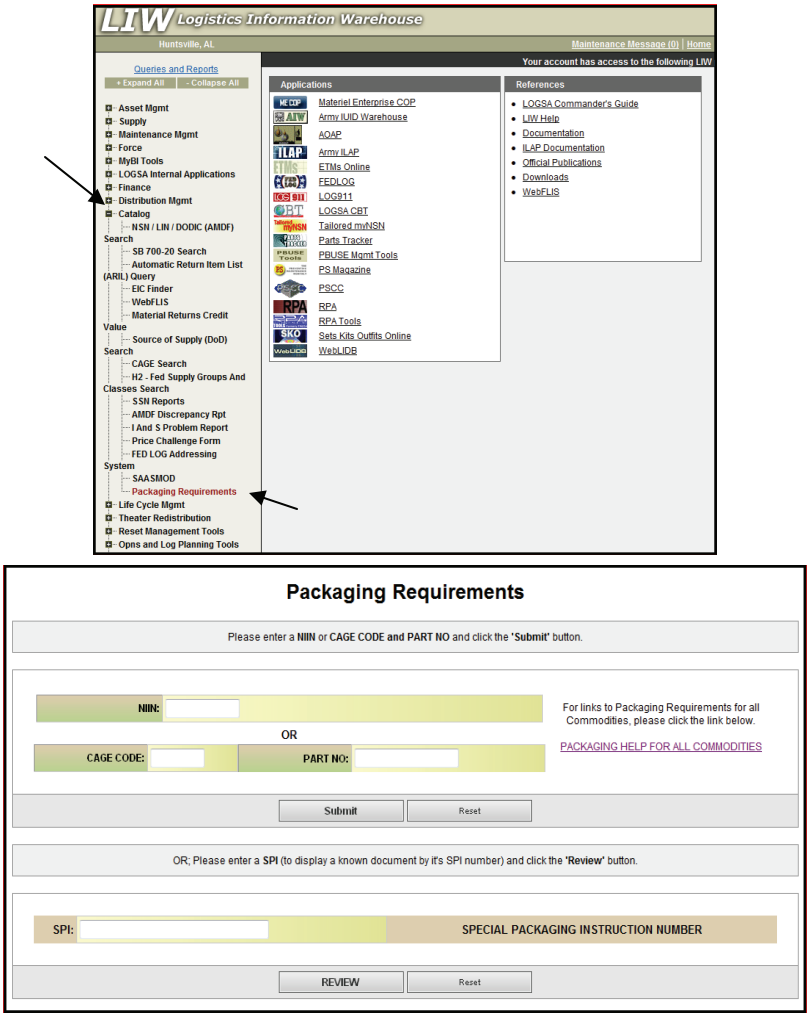
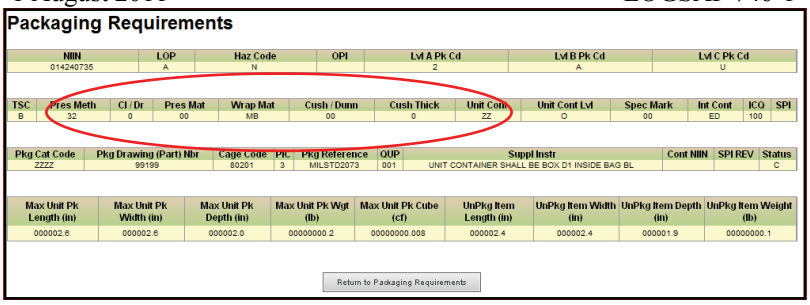


Figure 1: LIW Packaging Requirements screen

Enter NIIN (NSN minus first four digits), and click on “Submit”.
If SPI number is known, you can enter SPI and click on “Review” (if you receive a message indicating “no link yet available for this”, try searching with NIIN) - See Figures 2 and 3.



Packaging Requirements

NIIN	LOP	Haz Code	OPI	Lvl A Pk Cd	Lvl B Pk Cd	Lvl C Pk Cd
014240735	A	N		2	A	U

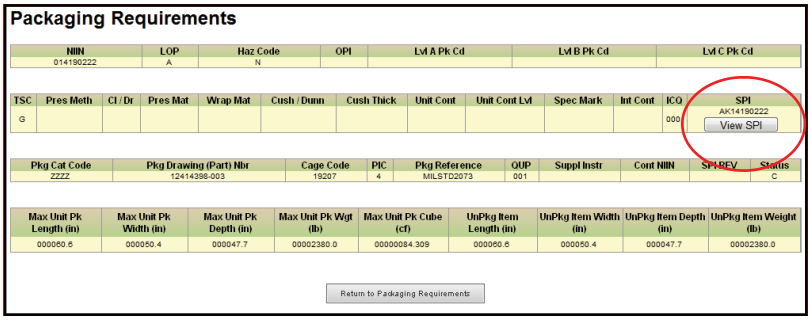
TSC	Pres Meth	Cl / Dr	Pres Mat	Wrap Mat	Cush / Dunn	Cush Thick	Unit Cont	Unit Cont Lvl	Spec Mark	Int Cont	ICQ	SPI
B	32	0	00	MB	00	0	ZZ	O	00	ED	100	

Pkg Cat Code	Pkg Drawing (Part) Nbr	Cage Code	PIC	Pkg Reference	QUP	Suppl Instr	Cont NIIN	SPI REV	Status
ZZZZ	99199	80201	3	MILSTD2073	001	UNIT CONTAINER SHALL BE BOX D1 INSIDE BAG BL			C

Max Unit Pk Length (in)	Max Unit Pk Width (in)	Max Unit Pk Depth (in)	Max Unit Pk Wgt (lb)	Max Unit Pk Cube (cf)	UnPkg Item Length (in)	UnPkg Item Width (in)	UnPkg Item Depth (in)	UnPkg Item Weight (lb)
000002.6	000002.6	000002.0	00000000.2	00000000.008	000002.4	000002.4	000001.9	00000000.1

Return to Packaging Requirements

Figure 2: NIIN search resulting in coded packaging requirements (32, 0, 00, MB, 00, 0, ZZ)



Packaging Requirements

NIIN	LOP	Haz Code	OPI	Lvl A Pk Cd	Lvl B Pk Cd	Lvl C Pk Cd
014190222	A	N				

TSC	Pres Meth	Cl / Dr	Pres Mat	Wrap Mat	Cush / Dunn	Cush Thick	Unit Cont	Unit Cont Lvl	Spec Mark	Int Cont	ICQ	SPI
G											000	AK14190222 View SPI

Pkg Cat Code	Pkg Drawing (Part) Nbr	Cage Code	PIC	Pkg Reference	QUP	Suppl Instr	Cont NIIN	SPI REV	Status
ZZZZ	12414398-003	19207	4	MILSTD2073	001				C

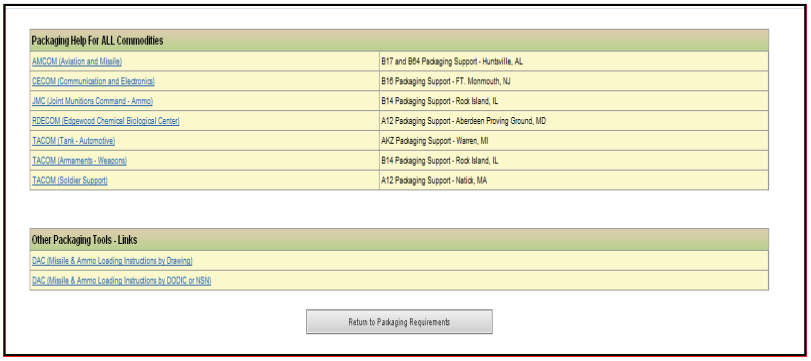
Max Unit Pk Length (in)	Max Unit Pk Width (in)	Max Unit Pk Depth (in)	Max Unit Pk Wgt (lb)	Max Unit Pk Cube (cf)	UnPkg Item Length (in)	UnPkg Item Width (in)	UnPkg Item Depth (in)	UnPkg Item Weight (lb)
000060.6	000050.4	000047.7	00002380.0	00000084.309	000060.6	000050.4	000047.7	00002380.0

Return to Packaging Requirements

Figure 3: NIIN search resulting in SPI "AK14190222"

If there is no packaging information in LIW, check FEDLOG.

If there is no packaging information in LIW or FEDLOG, click on "Packaging Help for all Commodities" (Figure 1), and then click on the appropriate link (Command) for further information (Figure 4).



Packaging Help For ALL Commodities	
AMCOM (Aviation and Missile)	B17 and B64 Packaging Support - Huntsville, AL
CECOM (Communication and Electronics)	B16 Packaging Support - FT. Monmouth, NJ
JMC (Joint Munitions Command - Ammo)	B14 Packaging Support - Rock Island, IL
RDECOM (Edgewood Chemical Biological Center)	A12 Packaging Support - Aberdeen Proving Ground, MD
TACOM (Tank - Automotive)	AKZ Packaging Support - Warren, MI
TACOM (Armaments - Weapons)	B14 Packaging Support - Rock Island, IL
TACOM (Soldier Support)	A12 Packaging Support - Natick, MA

Other Packaging Tools - Links
DAC (Missile & Ammo Loading Instructions by Drawing)
DAC (Missile & Ammo Loading Instructions by DODIC or NSN)

Return to Packaging Requirements

Figure 4: Links for Packaging Help based on Source of Supply (SOS) for NSN (e.g., if SOS is B16, click on "CECOM")

If further assistance is required, contact LOGSA PSCC @ (570) 615-7105.

Where to Find Item Packaging Data: FEDLOG

Open FEDLOG

1. Select “Search Interactive”.
2. Click on “ARMY” tab.
3. Enter NIIN or NSN in NIIN field (NIIN is NSN minus first four digits).
4. Select “Search”.
5. Click on “Army Packaging” tab (Figures 5 and 6).

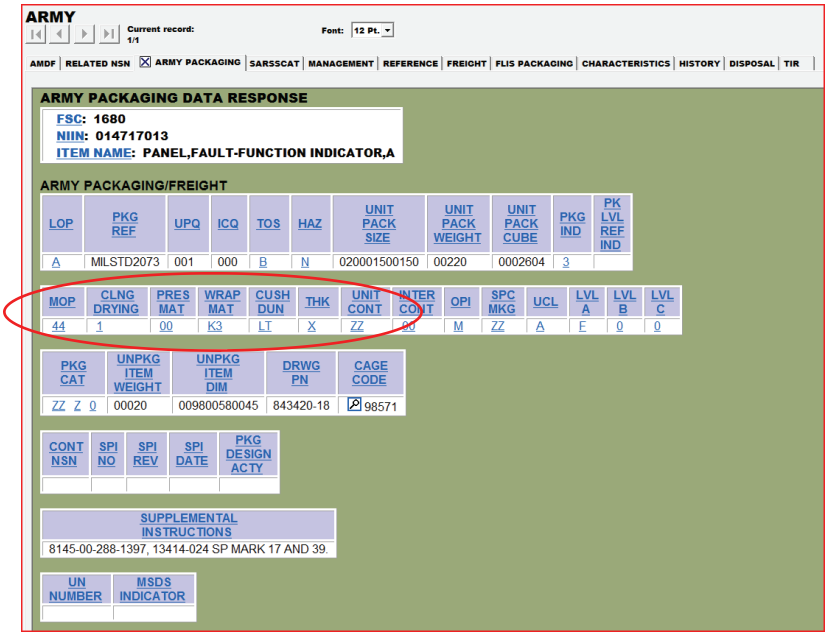


Figure 5: Results of NIIN 014717013 search in FEDLOG, showing coded packaging requirements (44, 1, 00, K3, LT, X, ZZ)

NOTE: In FEDLOG, you can click on the data elements in blue (e.g., WRAP MAT or K3) to get more information.

If an item’s packaging data is in coded format (Fig 5), use MIL-STD-2073-1, DoD Standard Practice For Military Packaging, to determine the meaning of the codes displayed.

If a SPI is listed (Fig 6), go to LIW to retrieve SPI or contact the packaging commodity POC to request SPI. You can find the packaging commodity POC using the “Packaging Help for all Commodities” link on the Packing Requirements page in LIW (Fig. 1).

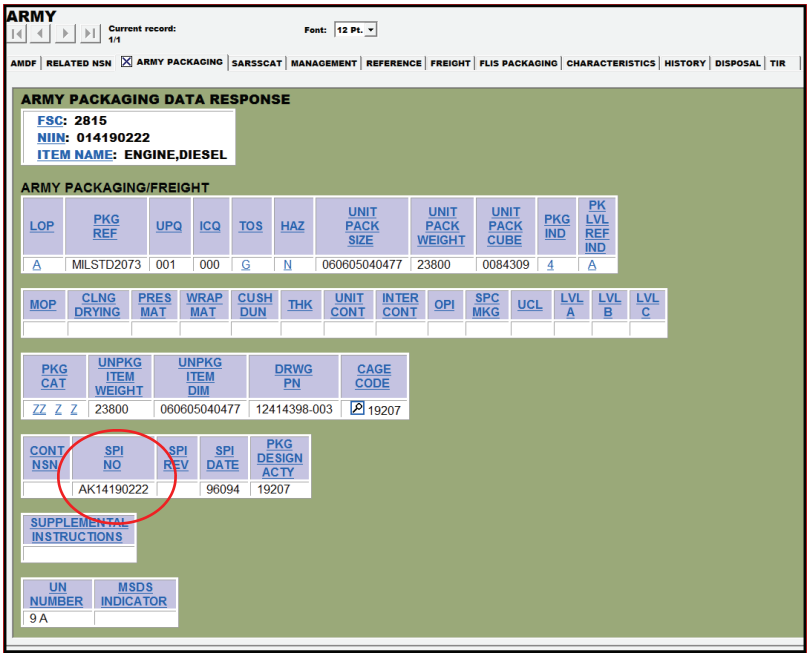


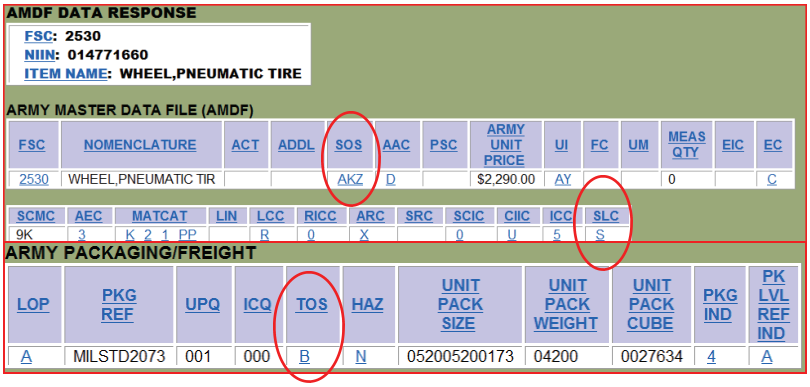
Figure 6: Results of NIIN 014190222 search in FEDLOG, showing SPI AK14190222 is required

6. If no packaging information or SPI is available under the "Army Packaging" tab, click on "FLIS Packaging" tab.

7. If no packaging information is available in FEDLOG/LIW, contact the packaging commodity POC to request instruction on packaging the NSN.

Other important information retrieved from FEDLOG (Figure 7):
SOS: Source of Supply (AMDF tab)
SLC: Shelf-life Code (AMDF tab)
TOS: Type of Storage (ARMY PACKAGING tab)

Figure 7: Results of NIIN 014771660 search in FEDLOG



Who is the Packaging Commodity POC for my item?

The packaging commodity POC is based on the SOS for the item. The SOS can be found on FEDLOG, AMDF tab (Fig. 7). Based on the SOS, follow the instructions below (this information was taken from LIW "Packaging Help for all Commodities" and is current as of Feb 2011).

B17 and B64 Packaging Support—Huntsville, AL (AMCOM)

E-mail "amcompackagingdata@conus.army.mil"

B16 Packaging Support—Fort Monmouth, NJ/Aberdeen, MD (CECOM)

E-mail "MONM-LRCPckgTeam@conus.army.mil"

B14 Packaging Support—contact individuals below depending on whether the item is "Weapon" or "Ammo"

Rock Island, IL (JMC—Ammo)

Rock Island, IL(TACOM—Armaments/Weapons)

A12 Packaging Support—Aberdeen Proving Ground, MD (RDECOM)

A12 Packaging Support—Natick, MA (TACOM—Soldier Support)

The SPIs for A12 can be found on the AKO website

AKZ Packaging Support—Warren, MI (TACOM—Tank/Automotive)

Go to website:

https://www-tdps.tacom.army.mil/PackagingHome.htm

Select "Packaging Database Query" (home screen below)

Search by NSN, NIIN, or Part Number

What if the SOS is "SMS" (DLA)?

If the original SOS (B16, AKZ, etc.) cannot be determined, contact PSCC for assistance @ (570) 615-7105.

Methods of Preservation

Preservation is defined as "protection that is provided for the bare item to prevent deterioration from exposure due to atmospheric conditions during shipment and storage." In military packaging, there are five basic methods of preservation:

Method 10 – Physical protection

Method 20 – Preservative coating only (with greaseproof wrap, as required)

Method 30 – Waterproof or waterproof-greaseproof protection (with preservative, as required)

Method 40 – Watervaporproof protection (with preservative, as required)

Method 50 – Watervaporproof protection with desiccant

Preservation, along with other applications of packaging, is normally preplanned or approved by technicians. The criteria for deciding the correct method is based on the item's characteristics such as its physical composition and the nature of the surface.

Many items, however, do require the same high level of protection. These include some engines, navigation equipment, gyros, ESD-sensitive items, etc. This is due to their high dollar value or their susceptibility to rapid deterioration/sensitivity to other elements. For unserviceable reparable return items, preservation requirements are usually of a lesser degree than their serviceable counterparts because this materiel is usually shipped to a depot or repair facility for short-term or controlled storage while awaiting maintenance. Before attempting to develop the method of preservation for any individual item, check for packaging instructions in LIW or FEDLOG, or contact the item manager. If no instructions are available, examine the characteristics of the item or requirements for a similar item.

MIL-STD-2073-1 lists all methods and submethods for military packaging.

Method 10

Method 10 – Physical protection: A method of preservation for items of chemically noncritical nature, made of corrosion-resistant metals or inert nonmetals such as crockery, ceramics, or non-optical glass, or items rendered deterioration-resistant by the application of metal plating, paint, prime coatings, plastic coatings, or similar treatments/ finishes. Items appropriate for Method 10 preservation include: motor vehicle bumpers, tires, and windshields; tent-poles, pegs, and wire fencing; and many other items designed to be used in an unprotected environment.

Method 10 (Bundling) – Bundling is appropriate for items of military supply such as lumber, tent-poles, stakes, rods, metal and non-metal pipes, etc. The following steps should be followed:

- STEP 1. Clean and dry the item as required.
- STEP 2. Apply cushioning, dunnage, or blocking and bracing to individual items that are damageable. Materials will be clean and as dry as practicable.

Note: Also apply protective pads (i.e., cushioning or fiberboard) between the item and the bundling material as required to prevent the strapping, wire, or twine from inflicting damage to the item).

- STEP 3. Tie, strap, or tape the items, as applicable, to form the unit pack.
- STEP 4. Apply markings according to MIL-STD-129.

Method 10 (Cartonizing or Boxing) – This involves enclosing the item cleaned, dried, cushioned, blocked and braced, as required, in a carton or box. Contact preservatives are prohibited as well as barriers that afford protection from the environment. Remember that any and all techniques used in Method 10 preservation protects the item from physical and mechanical damage only.

- STEP 1. Clean and dry the items required.
- STEP 2. Apply cushioning materials, dunnage, blocking and bracing as required to protect the items and the enclosing box or carton, and to restrict the movement of the item within the container.
- STEP 3. Enclose the item into a carton or box selected from MIL-STD-2073-1, as appropriate (see page 53, Container Selection).
- STEP 4. Apply markings according to MIL-STD-129.

Method 20

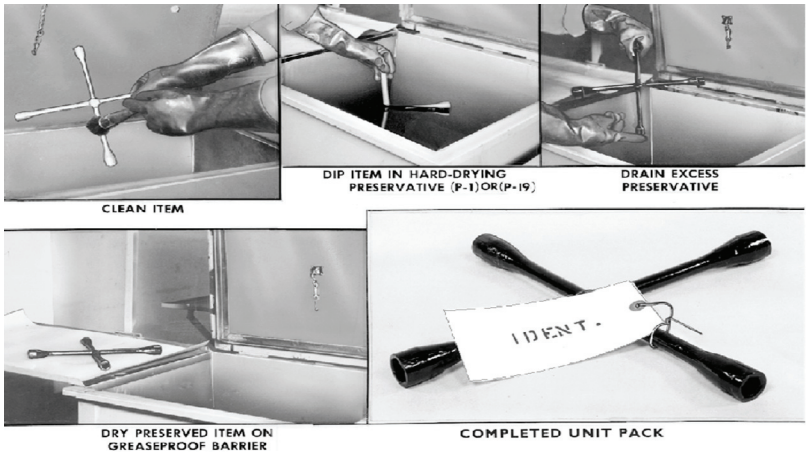
Method 20 – Preservative coating only (with greaseproof wrap, as required) is used primarily on metal items whose characteristics allow ready application of a corrosion preventive compound by dipping, flow coating, slushing, spraying, flushing, brushing, or fogging. Items preserved by Method 20 must be such that de-preservation by means of solvents, vapor degreasers, or alkali metal-cleaning compounds will not damage the item nor impair its operation. This is accomplished by applying a preservative coating to the item and using greaseproof wrap as required. The preservative coating protects the item against water, salt spray, gasses, and fumes that may be encountered during handling, shipping, and storage. The entire chemical protection afforded to the item is through the contact preservative.

- STEP 1. Clean and dry the item, as required.
- STEP 2. Select and apply a preservative coating to the item (or parts of the item), as required.

Note: Before proceeding to step 3:

Parts coated with code 01 or code 19 preservatives and allowed to dry do not require the wrap specified in step 3 unless called for in the contract or order. Items treated with Code JL, VCI-treated barrier material (MIL-PRF-22019) or bag (MIL-B-22020), and securely taped to make an airtight enclosure, shall be exempted from the wrap specified in step 3.

- STEP 3. Enclose the coated item, cushioned as required, in a wrap conforming to: MIL-PRF-121, Type I or II.
- STEP 4. Apply markings according to MIL-STD-129.



Method 30

Method 30 – Waterproof or waterproof-greaseproof protection (with preservative, as required) packs are appropriate for almost any time the item will fit into a bag; a rigid container other than all metal; or as long as only waterproof or waterproof-greaseproof protection is needed. If watervaporproof is required, then you must choose the Method 40 or Method 50. Method 32 application involves placing the item preserved, wrapped, and cushioned as required into a close-fitting box or carton that, in turn, shall be enclosed in a sealed waterproof bag. To assemble this method, perform the following steps:

- STEP 1. Clean and dry the item, as required.
- STEP 2. Select and apply a preservative coating to the item (or parts of the item), as required.
- STEP 3. Apply a greaseproof wrap conforming to MIL-PRF-121, Type I or II
- STEP 4. Select a close fitting inner container from MIL-STD-2073-1 (or a container specified by the contract or order) (see page 53, Container Selection).
- STEP 5. Insert the item into the container along with the application of cushioning and dunnage, as necessary, to protect the item as well as the container from the item's projections and sharp edges, and also to restrict its movement within the container.
- STEP 6. Blunt the sharp edges and corners of the box to protect the bag selected in step 7.
- STEP 7. Enclose the box in a bag conforming to MIL-DTL-117, Type I, Class B. The following are examples of barrier (bag) material meeting the MIL-DTL-117 requirement: A-A-3174, Type I or II, Grade A, Class 1(see note) and MIL-PRF-22191, Type III.

Note: When specified, a protective wrap of heavy-duty kraft paper or equivalent (tape sealed) shall be used to protect the barrier material.

STEP 8. Heat seal the bag. The trapped air between the box and the bag shall be kept to a minimum by compressing the bag or by a mechanical evacuation process (i.e., vacuum cleaner attachment). Caution shall be taken to prevent rupture of the bag.

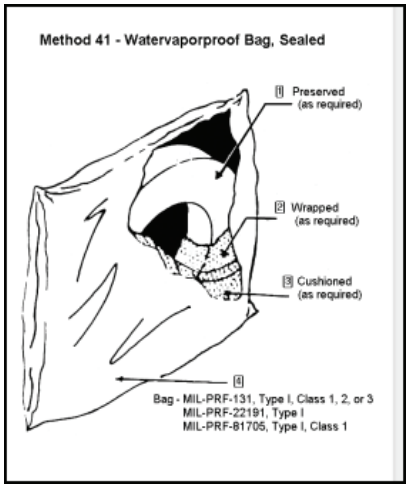
STEP 9. Apply markings according to MIL-STD-129.

Method 40

Method 40 – Watervaporproof protection (with preservative, as required). Sub Method 41, unit packing is intended to provide protection to metallic and nonmetallic items against deterioration caused by water or water vapor and by natural or industrial contaminates and pollutants. Items packed by Method 41 are generally light in weight and flat in shape, so as to lend themselves to easy insertion into the flat or envelop-type bag. This is accomplished by inserting the item wrapped and cushioned as necessary into a watervaporproof bag, exhausting the excess air and closing the bag. In the steps that follow, notice that this method is also used for items (such as circuit cards) that are sensitive to damage caused by ESD. Make sure that only the correct electrostatic protective materials, as indicated in the steps that follow, are used for the wrap and the bag when packaging items are ESDS:

- STEP 1. Clean and dry the item, as required.
- STEP 2. Select and apply a preservative coating to the item (or parts of the item). The manufacturer normally applies permanent preservative coatings to ESDS items.
- STEP 3. Apply a greaseproof wrap only if a soft dry preservative has been applied to the item.
- STEP 4. When greaseproof is not a requirement, apply a neutral wrap where a noncorrosive, dust protective wrap is required prior to or as part of unit packing. Wrap ESD-sensitive items in ESD protective cushioning material (see page 47).
- STEP 5. Place the item (wrapped and cushioned as required) into a close-fitting, heat-sealed bag, MIL-PRF-131.
- STEP 6. Mark the bag in accordance with MIL-STD-129.

~~Note~~: When specified by the contract or order, a carton or box shall be required to be used, with unit container cushioning specified in the contract, or order will be placed between the bag and the carton or box. Mark the carton or box in the same manner as the bag.



Method 50

Method 50 – Watervaporproof protection with desiccant. For Sub Method 51, the item preserved, wrapped, cushioned and desiccated, as required, shall be enclosed within a sealed bag. A humidity indicator and Method 50 label is required.

- STEP 1. Clean and dry the item, as required.
- STEP 2. Select and apply a preservative coating to the item (or parts of the item), as required. The manufacturer normally applies permanent preservative coatings to ESDS items.
- STEP 3. Apply a greaseproof wrap only if a soft drying preservative has been applied to the item.
- STEP 4. When greaseproofness is not a requirement, apply a neutral wrap where a noncorrosive, dust protective wrap is required prior to or as part of unit packing, if applicable.
- STEP 5. Place the item, including the required number of units of desiccant, wrapped, and cushioned, as required, into a close-fitting, heat-sealed bag, conforming to MIL-DTL-117. Bags made from the following material meet the MIL-DTL-117 requirements: MIL-PRF -131, Type I or II, Class 1 or 2 and MIL-PRF-81705, Type I, Class 1 (ESDS items only).
- STEP 6. Firmly secure the humidity indicator immediately within the closing edge of the bag that is applied in the next step.
- STEP 7. Mark the bag in accordance with MIL-STD-129, including the application of a Method 50 label.

~~*Note*~~*: When specified by the contact or order, a carton or box shall be required to be used with the unit container. Cushioning specified in the contract or order will be placed between the bag and the carton or box. Mark the carton or box in the same manner as the bag.*

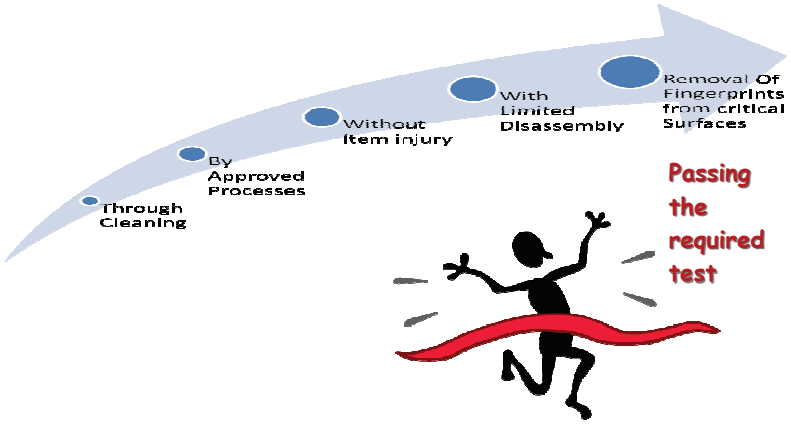
~~*Note*~~*: When space is not available to permit the use of a label, the words "DESICCATED PACKAGE - DO NOT OPEN UNTIL READY FOR USE" shall be placed on the container adjacent to the identification markings.*

Preservation Procedures

Cleaning—All contaminants must be removed before items that are being shipped internationally can be accepted for transport by the US Department of Agriculture, or host nation customs. Also, any contaminant left on an item will cause deterioration. **The cleaning process must not harm the item**. Limit the disassembly to a point where reassembly can be easily done without special tools or skills.

Methods to use include:

- Wire brushing to remove loose scales and light rust from items.
- Vacuum cleaning for radios and electronic items to remove dust, lint particles, etc.
- Jet spray washing, a high-pressure stream of water, is best used on items that won't be harmed by the pressure or water.
- Abrasive blasting, a high velocity stream of an abrasive material against the surface of the item, should be used on surfaces where the abrasive action will not affect the function of the item such as rough castings, pintle hooks, etc.
- Steam cleaning, a stream of steam with an added cleaning compound followed by steam alone, is to remove heavy greases from automotive equipment, such as trucks.
- Ultrasonic cleaning is used on nonabsorbent materials such as those found in electronic devices.



Drying—The following methods can be used: compressed air, ovens, infrared lamps, wiping, and draining. **The drying process must not harm the item.** Immediately after cleaning, items must be thoroughly dried to remove cleaning solutions or residual moisture.

Contact Preservatives-Are applied to items to protect them from deterioration due to exposure to adverse environmental conditions during shipment and storage. Most contact preservatives are oily or greasy in nature and vary greatly in chemical composition and consistency; therefore, they cannot be used indiscriminately on all kinds of materials. Lubricating oils and greases can be used, but oils and greases may be inadequate for the full protection desired. Selecting the right preservative must be as carefully considered as selecting a proper cleaning process.

Permanent types of preservatives for metal items include paint, plastic, porcelain, and rubberized coating. Temporary preservatives that are used in packaging are identified as Method 20. They are applied by dipping, flowcoating, slushing, brushing, filling, flushing, fogging, and spraying. Volatile Corrosion Inhibitors (VCI) are also classified as a preservative and are applied by wrapping the VCI material around the item.

Petroleum based preservatives can cause skin and eye irritation. Avoid direct contact by wearing the appropriate safety equipment. When spraying or fogging, always wear goggles and a respirator. When applying preservatives by hand, always wear rubberized gloves and an apron if appropriate. To decide which preservative to use, check MIL-STD-2073-1, Packaging Instructions.

Application Of Contact Preservatives

DIPPING - Due to ease of application and total coverage afforded by this procedure, it **is the preferred method of application**. When items are dipped in a tank by hand or by conveyor, care must be taken so that air bubbles are not trapped on the preserved item. Frequent stirring of the preservative will prevent air bubbles from forming. After the preservative has dried or set, the item should be placed on a precut piece of greaseproof barrier material.

FLOWCOATING - Pour preservative into tube allowing it to flow through tube and cover interior surfaces. Drain excess preservative from tube by holding tube over preservative tank, allowing preservative to drain into tank.

SLUSHING - This procedure is accomplished by pouring the preservative into the part to be preserved and rotating, agitating, or slanting it to ensure that all interior surfaces are coated. The excess preservative is then drained. After slushing, all openings in parts must be closed to exclude dust, dirt, and other foreign matter. Plastic plugs may be used for this purpose.

BRUSHING - This procedure should be used when no other procedure is available or acceptable. Brushing is used frequently when only one portion or small portions of an item or assembly require preservative application.

FILLING or FLUSHING - This procedure is accomplished by completely filling the item with preservative until all interior surfaces are satisfactorily coated and then drained. If the preservative is not drained, space must be allowed for thermal (temperature) expansion. All openings should be sealed to prevent leakage. This procedure is best suited for larger items because of their size or weight cannot be easily handled.

FOGGING - This procedure has application in the preservation of such items as gasoline tanks, interior surfaces of engine cylinder walls, and other closed chambers. This procedure consists of coating the interior surfaces with a preservative injected as a cloud or mist from an air atomizing gun until the interior surfaces are completely coated.

SPRAYING– This procedure is accomplished by coating the interior or exterior surfaces of the item with preservative applied as a spray. Normal spray painting techniques should be followed in the application of preservatives by this method.

Desiccant, Think About It.

Desiccant will be needed in some of the preservation steps.

Desiccant is a moisture-absorbing material that is required for all Method 50 packs. Desiccant is furnished in bag units and is available in sizes from 1/6-unit to 80-unit bags. Its purpose is to absorb any moisture that may sneak through the barrier material.

Some dos and don'ts for storing, handling, and applying desiccant :

DO APPLY:

- Desiccant to all Method 50 packs.
- A greaseproof wrap to items having contact preservative to segregate desiccant from incompatible elements.
- Secure bag units evenly around the item.
- Humidity indicators to all desiccated packs.

DO NOT:

- Use damaged or frayed unit bags.
- Allow unit bags to be packed or stored in or near incompatible elements such as lubes or oils.
- Remove desiccant bags from their storage container until ready for use.

Quantity of Desiccant – The minimum quantity of desiccant to be used per unit pack shall be computed in accordance with either Formula I or II as applicable. The various values of "X" take into consideration the quality and types of dunnage calculations.

Desiccant formula I: All other than, a rigid, all metal type container:

$$U = CA + X_1D + X_2D + X_3D + X_4D$$

Desiccant formula II: For rigid, all metal container:

$$U = KV + X_1D + X_2D + X_3D + X_4D$$

U = Number of units of desiccant to be used.
C = 0.011 when area of barrier is given in sq. in.
C = 1.6 when area of barrier is given in sq. ft.
A = Area of container (barrier) in either sq. in. or sq. ft. (A=L x W) (This is the surface area of the barrier material.)
K = 0.0007 when the volume is known in cu. in.
K = 1.2 when the volume is known in cu. ft.
V = Volume within the container in cu. in. or cu. ft.
X = A numerical factor varying with the quality and type of dunnage used. The following applies as appropriate.
X_1 = 8 for cellulosic material, including wood and any other material not categorized below
X_2 = 3.6 for bound fibers (synthetic or vegetable fibers bound with rubber)
X_3 = 2.0 for glass fibers (fiberglass)
X_4 = 0.5 for synthetic foams and rubber
D = Pounds of dunnage within the sealed barrier

Barrier Bag Fabrication and Sealing

Sealed bags are designed to protect an item from water/water vapors. Bagged items should never be opened or removed from the unit, intermediate, or shipping container to facilitate storage. Bags, in themselves, are very susceptible to damage from tearing or pinholes, which can cause corrosive deterioration to the item. Supply discipline dictates that you should keep the bagged item in the box until it is ready for use.

The following instructions exemplify preservation Methods 32, 42, and 52 where the item is packed in a box and the box is sealed in a bag. For other preservation methods that require bagging the bare item, the same measuring procedures should apply, except the bare item dimension will apply as opposed to the box dimensions. When measuring the bare item, always allow for cushioning. If the item is being preserved by Method 50, allow for units of desiccants.

An easy formula for determining the correct bag size is:

Material Length = Total Girth Dimensions + 4”

Material Width = Length + Depth + 4”

(Four inches are added to facilitate sealing)

- STEP 1. MEASURE THE BOX/ITEM - If the box is 20” x 12” x 12”. The material size will be determined using the following procedure:

Material Length = (12 x 2) + (12 x 2) + 4 = 52 inches

Material Width = 20+12+4 = 36 inches

Flat Cut Material is 36 X 52 inches

- STEP 2. CUT AND FOLD THE MATERIAL.

- STEP 3. HEAT SEAL TWO EDGES OF THE FOLDED MATERIAL - Before attempting to heat seal, adjust the dwell temperature and pressure according to the manufacturers recommendations. Allow the heat sealer to warm up and make a "test" seal before using it to seal the bags. The minimum width of the sealed joining should be 5/8 inch.

- STEP 4. BLUNT ALL CORNERS OF THE BOX AND PLACE BOX INTO THE BAG - AIR EVACUATION - Bags used for preservation Methods 30 and 40 with submethods may have excessive air removed by simply collapsing the bag by hand or vacuum nozzle around the boxed item. For bags being fabricated for Method 50 including submethods, air must be evacuated by following steps 5 and 6.

- STEP 5. Seal remaining opening and cut off one corner.

- STEP 6. Evacuate air with a vacuum nozzle and seal the corner.

Basic Packaging Materials

BASIC PACKAGING MATERIALS ARE LISTED HERE BY SPEC NUMBER, TYPE, CLASS, NATIONAL STOCK NUMBER (NSN), AND FUNCTION. THIS SHOULD HELP YOU IN DETERMINING WHICH MATERIALS YOU NEED FOR THE TYPES OF ITEMS THAT YOU ARE PROCESSING. FOR EXAMPLE, WE HAVE LISTED TWO DIFFERENT TYPES OF MIL-P-81997 BARRIER MATERIAL, BUT EACH OF THEM HAVE A DIFFERENT FUNCTION AND COME IN DIFFERENT SIZES. TO ORDER THE TYPE THAT YOU MAY NEED, YOU MUST FIRST DETERMINE WHAT TYPES OF ITEMS ARE GOING TO BE PACKAGED. YOU SHOULD BE ABLE TO DECIDE WHICH TYPE YOU NEED BY REFERRING TO THE "INTENTED USES" INFORMATION PROVIDED UNDER THE MATERIAL SPEC IN THIS SECTION.

Not all packaging materials will be listed here. Purchasers shall select the preferred options permitted herein and include the following information in procurement documents: basic information asked such as title, number, and date of the document.

Type, grade, finish and nominal thickness.

- **Color required, if applicable**
- **Length and width required**
- **Single thickness or lay flat tubing**
- **Unit of issue**

For additional information that may be needed, please check the individual document.

Barriers Used In Military Packaging

A-A-3174 -Plastic Sheet, Polyolefin

Status– Active

Last Document Date– 13 Jun 2007

Classification

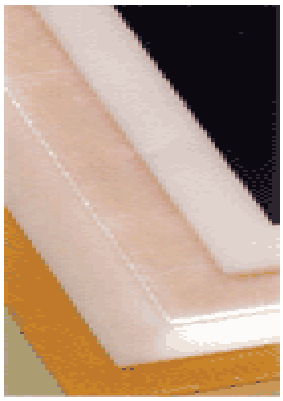
Type I - Normal strength polyethylene
Type II - High strength polyethylene
Type III -Polypropylene
Type IV - Heat shrinkable polyethylene
Type V - Heat shrinkable weather resistant polyethylene
Type VI - High density polyethylene
Class 1 - For non-food application
Class 2 - For use in contact with food
Class 3 - Biaxial oriented
Class 4 - Preferentially oriented
Grade A - Low slip
Grade B - Medium slip
Grade C - High slip
Finish 1 - Untreated
Finish 2 - Treated

Intended Use

Type I or II, Class 1 is used in Methods 31 and 32
Polyolefin film covered by A-A-3174

For use in general purpose packaging applications where high degree of water resistance, moderate moisture vapor resistance, and dust protection are desired.

- Flexible
- Colorless, Transparent
- Impact resistant
- Water resistant
- Tear resistant



Barrier Materials (cont.)

QQ-A-1876 -Aluminum Foil

Status– Active

Last Document Date– 16 Aug 1990

Classification

Type I - Rolls
Type II - Interfolded Flat Sheets
Type III - Single ply flat sheets
Class 1 - Flat Sheets, 12" x 10 3/4
Class 2 - Flat Sheets, 9" x 10 3/4
Grade A - Food Use
Grade B - Other use

Intended Use

Grade A used to wrap food.
Grade B used in Method 20 as a greaseproof wrap.
The foil is .0005-inches thick and less is suitable for aircraft applications such as shielding or insulating components.
Foil .0010 inch and heavier is suitable for use as a non-corrosive barrier between wood and other surfaces coated with a preservative or between treated surfaces to prevent corrosion.

QQ-A-1876 specifies uncoated aluminum foil.

- Dry-annealed or slick annealed finish
- Non-corrosive
- Uncoated
- Flexibility and strength permit folding and shaping in both manual and machine operations

Barrier Materials (cont.)

PPP-B-1055 -Barrier Material, Waterproof, Flexible

Status– Inactive

Federal Specification PPP-B-1055B, dated 22 April 1989, is inactive for new design and is no longer used, except for replacement purposes.

Classification

Multiple classes and uses
B-1, B-2, B-3 - Bailing and interior wraps
C-l, C-2(a), C-3 - Interior wraps, crate liners
E-l - Interior wraps, crate liners
E-2 - Interior wraps, crate liners, shrouds, bailing
H-2, H-3(a), H-4 - Case liners
L-2(b) - Case and crate liners
L-4 - Temporary tarpaulins
M -1 - Crate liners, case liners, shrouds
P-l - Ammunition containers

Intended Use

Bailing
Interior wraps
Case liners
Crate liners
Shrouds
Temporary tarpaulins
Ammunition Container

Barrier Material, Waterproof, Flexible covered in PPP-B-1055; was for use in packaging and packing applications which require waterproofness plus a high degree of resistance to infiltration by water vapor.

- Kraft paper laminated with asphalt intended use
- Some classes are reinforced with strands or cords
- Waterproof
- Resistant to water vapor
- Sealable with adhesive or tape except B-1, B-2, B-3, and L-4
- Abrasion resistant dry or wet

Barrier Materials (cont.)

MIL-PRF-81705 -Barrier Materials, Flexible, Electrostatic Discharge -Protective, Heat-Sealable

Status– Active

Last Document Date– 8 Feb 2010 Revision E, with amend.1

Classification

Type I - Watervaporproof, electrostatic, protective, and electrostatic and electromagnetic shielding
Type III - Transparent, waterproof, electrostatic protective, electrostatic shielding
Class 1 - Suitable for hand operated or automated sealing equipment
Class 2 - Suitable for automated sealing equipment

Intended Use

Used in Methods 31, 32, 41, 51, 52, and 53
Type I is used for watervaporproof, electrostatic and electromagnetic protection of microcircuits and semiconductor devices, such as diodes, field effect transistors, and sensitive resistors
Type III is used where a transparent, waterproof, electrostatic-protective and electrostatic field protective barrier is required and is limited to interior wrap or bag.

MIL-PRF-81705; establishes the requirement for heat-sealable, electrostatic discharge protective, flexible barrier materials used for the military packaging of microcircuits, sensitive semiconductor devices, resistors, and associated higher assemblies. In addition, the type I material provides for watervaporproof protection and attenuation of electromagnetic interference effects.

- Characteristics ESD Protective
- Watervaporproof
- Non-corrosive
- Heat-sealable

Barrier Materials (cont.)

MIL-PRF-121-Barrier Materials, Greaseproof, Waterproof, Flexible, Heat-Sealable

Status– Active

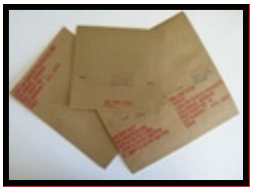
Last Document Date– 30 Apr 2001 Revision G

Classification

Type I - Medium Duty
Type II - Light Duty

Intended Use

MIL-PRF-121 is used in Methods of Preservation 20 and 33 as a primary source of barrier materials that provide waterproof and greaseproof protection for applicable items.



Barrier Materials (cont.)

MIL-PRF-131 -Barrier Materials, Watervaporproof, Greaseproof, Flexible, Heat-Sealable

Status– Active

Last Document Date– 18 Aug 2005 Revision K

Classification

Class 1 - Plastic backing (non-woven)
Class 2 - Kraft backing (limited use)
Class 3 - Scrim backing (woven fabric)

Intended Use

Used in Methods 41, 42, 43, 51, 52, and 53

Class 1 material with plastic non-woven backing is intended to be used in packaging applications where heat-sealable, flexible, watervaporproof, greaseproof, barrier materials are required.

Class 2 material with kraft backing isused for packages where the combined weight inside the barrier does not exceed 10 pounds. Class 2 material should be limited to use in bags whose length plus width does not exceed 42 inches.

Class 3 is similar to Class 1 but is used for those applications where a higher strength heat-sealable, flexible, watervaporproof, greaseproof barrier material is required.

MIL-PRF-131; covers the requirements for heat-sealable, greaseproof, flexible barrier materials having low water vapor transmission characteristics for use in military packaging.

- Flexible
- Heat-sealable
- Non-corrosive
- Watervaporproof
- Greaseproof

Barrier Materials (cont.)

MIL-PRF-22019 -Barrier Materials, Transparent, Flexible, Sealable, Volatile Corrosion Inhibitor (VCI) Treated

Status– Active

Last Document Date– 16 April 2010 Revision E w/Amendment 1

Classification

Type I - Heat-sealable
Type II - Pressure (cold) sealable
Class 1- Medium Duty
Class 2– Light Duty

Intended Use

Type I material is used where a heat-sealable, VCI-treated barrier material is required
Type II material used where either production or custom hand processing requires a cold-sealable material with corrosion inhibiting ability material.

MIL-PRF-22019 establishes the requirements for heat or pressure sealable, transparent flexible barrier material containing a VCI for use in military packaging.

CAUTION: Wear gloves and protective clothing. Mild irritant to eyes and hands.

- Vapor inhibitor ability
- Vapor inhibitor ability after exhaustion
- Transparent
- Storage stability
- Long-term protection
- Seam and fabrication strength
- Flexible
- Non-corrosive

Barrier Materials (cont.)

MIL-PRF-22191 -Barrier Materials, Transparent, Flexible, Heat Sealable

Status– Active

Last Document Date– 31 Mar 2008 Revision F

Classification

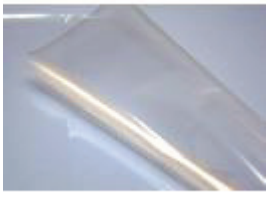
Type I - Watervaporproof, greaseproof
Type II - Waterproof, greaseproof
Type III - Waterproof
Class 1 - Unlimited use
Class 2 - For use on automated bag making machines only

Intended Use

Type I is used in Methods 41 and 51
Type II is used in Method 33
Type III is used in Methods 31 and 32
Used where a transparent protection is required.

MIL-PRF-22191 establishes the requirements for transparent, flexible, heat-sealable barrier materials having waterproof or low water vapor transmission characteristics for use in military packaging.

- Transparent
- Flexible
- Heat sealable
- Non-corrosive
- Waterproof (all 3 Types)
- Greaseproof (only Types I and II)
- Watervaporproof (only Type I)



Barrier Materials (cont.)

MIL-PRF-3420 –Wrapping Materials, Volatile Corrosion Inhibitor (VCI) Treated, Opaque

Status – Active

Last Documented Date – 31 Mar 2008 Revision H

Classification

Class I - Heavy duty
Class 2 - Medium duty
Class 3 - Light duty
Style A- Kraft, flat: Single ply or laminated
Style B - Kraft, creped or embossed: Single ply or laminated
Style C - Greaseproof, waterproof, moldable. Laminated to carriers conforming to QQ-A-1876

Intended Use

Protection from exposure to the extremes of the Navy/Naval aviation environment
Protection of ferrous materiel

MIL-PRF-3420; covers wrapping materials (carriers) which have been treated either by coating or impregnating with a corrosion inhibitor.

CAUTION: Wear gloves and protective clothing. Mild irritant to eyes and hands.

- Vapor inhibitor ability
- Vapor inhibitor ability after exhaustion
- Long-term protection
- Seam and fabrication strength
- Non-corrosive
- "DO NOT USE WITH FOODSTUFF"

Wraps Used in Military Packaging

A-A-203- Paper, Kraft, Untreated

Status– Active

Last Document Date– 19 Nov 2004 Revision C Notice 3– Validation

Classification

Style 1 - Rolls
Style 2 - Sheets

Intended Use

General wrapping applications
Does not provide chemically neutral or watervaporproof barrier

A-A-203; describes brown paper kraft paper used for general wrapping applications.

- Untreated
- Unbleached

Wraps (cont.)

A-A-50177- Paper, Lens

Status– Active

Last Document Date– 19 Mar 2007 Revision B

Classification

Type I - Cleaning Paper
Class 1 - Lightweight, white colored
Class 2 - Medium weight, white colored
Class 3 -Heavyweight, silicone treated, lavender color
Class 4 - Heavyweight, wet strength, white colored
Class 5 - Lightweight, wet strength, white colored

Type II - Wrapping/covering for coated optical surfaces
- White or natural

Intended Use

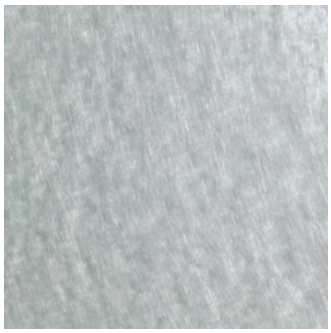
Type I lens paper is used for wrapping and cleaning lenses and other glass and highly polished surfaces

Type II lens paper is used for wrapping or covering all coated optics

Classes 1, 2, and 3 are for dry cleaning applications; classes 4 and 5 for wet cleaning

Paper, Lens covered by A-A-50177 covers non-abrasive lens paper.

- Non-abrasive
- Non-corrosive



Wraps (cont.)

MIL-DTL-17667 - Paper, Wrapping, Chemically Neutral (Non-Corrosive)

Status– Active

Last Document Date-21 Apr 2005 Revision E

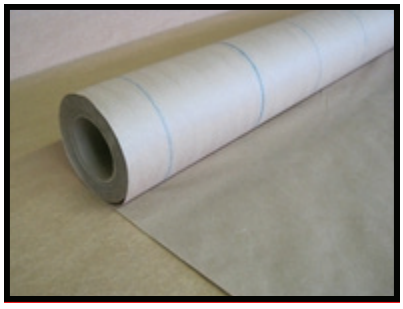
Classification

Type I - Flat
Type II - Creped

Intended Use

Used as a preliminary wrap
Dust protection
Used in the Navy's Prime Program. It provides a neutral wrap or cushioning material for unique Navy plastic disposal requirements in a marine environment.

- Non-corrosive
- Flexible
- **NOT** Greaseproof



Tapes Used in Military Packaging

SAE AMS-T-22085 Tapes, Pressure-sensitive Adhesive, Preservation and Sealing

Status - Active

Last Document Date– 10 Sep 1999

Classification

Type II – For use with or without over coating
Type IV – For use with or without over coating for extended times

Intended Use

Type II primarily used for Sealing military vehicles, aircraft, and related equipment. Used without coating when not exposed to outdoor elements. Used with over coating when outdoor storage is expected
Type IV used for extended periods of outdoor storage

- Pressure –sensitive adhesive
- Water-insoluble
- Colors:
- Type II – Black
- Type IV – Any color other than black Intended Use

Tapes (cont.)

A-A-1671 -Tape, Gummed, (Paper Reinforced), Laminated

Status– Active

Last Document Date– 10 Nov 2004

Classification

Type I - Laminated with an asphalt or asphaltic-type material
Type II - Laminated with a water resistant material non asphalt-type material
Class 1 - Strippable, suitable for use on food packages
Class 2 - Non-strippable, suitable for closure of fiberboard boxes for domestic shipment and storage, and in securing wrappers of packages
Style A - 2-way reinforcement
Style B - 3-way reinforcement

Intended Use

Closure of packages and fiberboard boxes

- Reinforced laminated Kraft-paper backed tape

Tapes (cont.)

ASTM D5486/D5486M -Standard Specification for Pressure-Sensitive Tape for Packaging, Box Closure, and Sealing

Status– Active

Last Document Date– 2006

Classification

Type I - Waterproof, weather-resistant, polyester backed
Class 1 - Colored
Class 2 - Transparent
Type II - Water-resistant, polyester-backed
Class 1-Tan
Class 2 - Transparent
Type III - Weather-resistant, polypropylene
Type IV - Water-resistant, woven cloth backed
Type V - Weather-resistant, paper backed

Intended Use

Type I is used for box closure and sealing where strength and resistance to sun light, rain, and other deteriorating elements are required
Type I Class 2 is also used for label attachment
Types II is used for domestic fiberboard box closure. It is the most suited for center seam closure of regular or regular slotted boxes and other applications where the tape will not be overlapped onto itself
Type III is used where water resistance is desired
Type IV is used for less critical packaging applications where a cloth-backed tape is desired
Type V is used for box closure and sealing for weather-resistant and water resistance

- Pressure sensitive adhesive

Tapes (cont.)

ASTM D5330 / D5330M - Standard Specification for Pressure-Sensitive Tape for Packaging, Filament-Reinforced

Status– Active

Last Document Date -2006

Classification

Type I - Cut-resistant (polyester reinforced)
Type II - Medium Tensile Strength
Type III - High Tensile Strength
Type IV - High Tensile Strength, Weather Resistant

Intended Use

Type I is used for bundling and similar applications and used where a greater amount of stretch before break provides an improvement in impact resistance over glass filament reinforcement

Types II and III are used for reinforcement of Regular Slotted Container (RSC) and similar fiber board boxes, and for bundling where a snug bundle must be maintained and other similar applications

Type IV is used when weather resistant tape high-tensile strength is required

- Filament Reinforced
- Water insoluble, Pressure-sensitive
- Adhesive
- Colors:
  Type I and III - other than black
  Type II - Transparent
  Type IV - Black

Tapes (cont.)

ASTM D5749/D5749M -Standard Specification for Reinforced and Plain Gummed Tape for Sealing and Securing

Status-Active

Last Document Date– 2006

Classification-

Type I - Reinforced, laminated
Class 1 - Strippable
Class 2 - Non– strippable
Type II - Plain, single ply, strippable
Grade A - Light duty for light weight packages
Grade B - Medium duty for medium weight packages
Grade C - Heavy duty for heavy weight packages

Intended Use

Type I is used for box closure Methods 2C2, 2C3, and others listed in ASTM D1974/D1974M
Type II is used for box closure Methods 2C4, 2C5, and others listed in ASTM D1974/D1974M

- Water activated (Type I)
- Pressure-Sensitive adhesive (Type II)

Tapes (cont.)

ASTM D6123 / D6123M Standard Specification for Pressure Sensitive Tape for Light Duty Packaging and General Purpose Masking

Status– Active

Last Document Date– 6 Oct 09

Classification

Type I – Creped paper backed
Type II – Flat paper backed

Intended Use

Type I is used where conformability is desired
Type II is used for where additional strength is desired or for straight -line masking
Use for bundling small parts to be over-packed
Used to hold small parts to larger assemblies
Used for temporary closure of chipboard and fiberboard boxes
Used for masking of surfaces to prevent being covered by paints, stains, varnishes, or other finishing materials

- Pressure-sensitive adhesive

Tapes (cont.)

MIL-T-43036 Tape, Pressure-sensitive, Adhesive Plastic Film (for Sealing Fiber Containers and Cans)

Status– Active

Last Document Date– 4 Jan 1993 Revision B w/3 Amendments

Classification

Type I – Reinforced polyester film
Type II – Non-reinforced polyester film

Intended Use

Used primarily for sealing fiber containers and cans and for slip-cover metal containers.

- Waterproof
- Watervaporproof
- Medium Tensile Strength
- Good low temperature
- Pressure sensitive

Work Areas

Basic Packaging Area-

ESD Packaging Area-

All ESD areas should be clearly marked and segregated from the Basic Packaging area.
The most basic you can have is contained in an ESD protective field service kit (NSN 5920-01-253-5368) which consists of the following:

- Pouch, MIL-DTL-81997, Type II;
- Barrier bag, MIL-PRF-81705, Type I;
- Wrist strap;
- 1 each - ground cord; and
- 1 each - mat, static dissipating

The ESD area should be free of debris, food, drinks, electronic devices (cell phone, radio, etc), and only authorized tools may be used.

Basics of Electrostatic Discharge (ESD)

NOTE: *Packaging requirements for ESD items are all the same, regardless of the item's condition.*

The following instructions provide minimal procedures for packaging of ESD-sensitive items. Preservation Method 41 is required. Preservation Method 41 for an ESD sensitive item is the same application except packaging materials are antistatic.

- STEP 1. Connect the field service kit (or work station) to ground and wrist.
- STEP 2. Wrap the bare item in antistatic cushioning and wrapping, e.g., MIL-PRF-81705, type I or II.
- STEP 3. Place the wrapped item in a bag made of MIL-PRF-81705 barrier material and heat seal.
- STEP 4. Apply ESD attention label and ID markings to the bag. If this label is not available, type the same information on a gummed label

Note: *Per MIL-STD-129, "all unit packs shall be marked with the ESD sensitive devices attention label prescribed by ASTM D 5445"; the label shall include the ESD sensitive device symbol (triangle and reaching hand), the words "ATTENTION STATIC SENSITIVE DEVICES," and the statement "HANDLE ONLY AT STATIC SAFE WORK STATIONS." The symbol and lettering on the label shall be marked in black on a yellow background."*

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- STEP 5. Place the preserved item in the appropriate fast-pack.
- STEP 6. Close the box and apply appropriate tapes.
- STEP 7. Apply ESD attention label and unit ID markings per MIL-STD-129.

Basic Tools & Equipment

Heat Sealer– You should purchase heat sealers that can be used in handheld or tabletop configurations. You want to make it easy and lightweight to use so that an operator may insert any heat sealable material into the slot on the bottom edge of the machine.

Heat sealers are sold for both "supported" and "non-supported" heat sealable packaging materials. If possible, both types should be purchased.

Basic Use– The material is guided through the machine by a pair of timing belts at a fixed speed of 200 inches per minute. While inside the machine, the material is heated, then compressed, creating a secure airtight seal. Sealed material exits opposite end of unit.

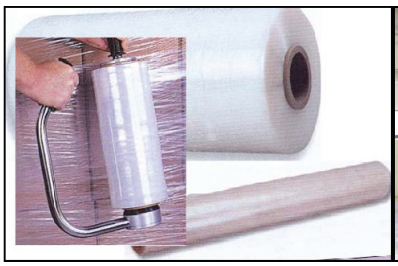
Stretch Wrap– Machine/Manual

Stretch wrap or stretch film is a highly stretchable plastic film that is wrapped around items. The elastic recovery keeps the items tightly bound.

Basic Use- In pallet unitizing, stretch wrap can have several functions:

- Improved stability of products or packages, forming a unit load
- More efficient handling and storage of unit loads
- Some degree of dust and moisture protection
- Some degree of tamper resistance and resistance to package pilferage

Making sure cartons stay on the pallet is an important consideration in warehouse distribution, especially as the demands for increased throughput continues to rise. Stretch wrapping is the most cost-effective way to keep loads secured on a pallet.



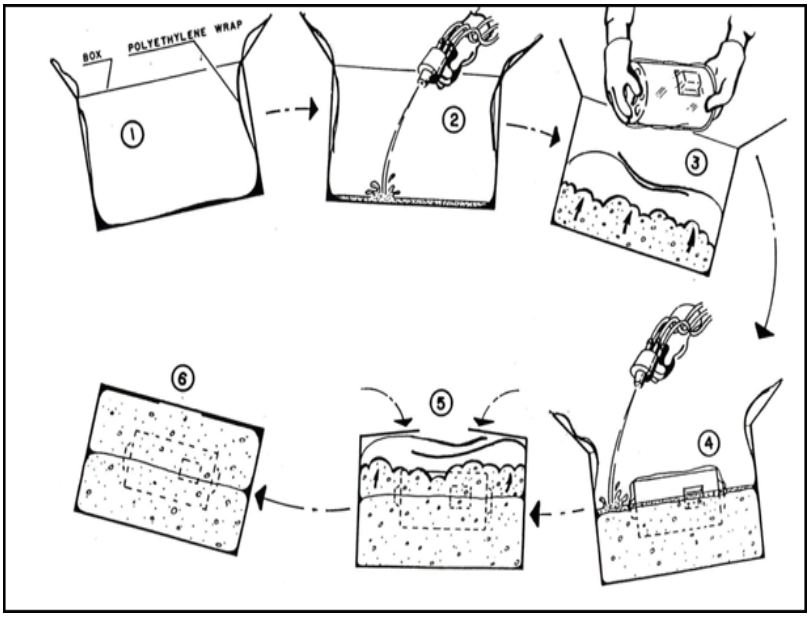
Basic Tools & Equipment (cont.)

Foam-In-Place (FIP)– Is a packaging process where two chemical components are dispensed in liquid form, which chemically react, expand, and rise as foam, and conform to the item and the inner walls of the box to form a complete pack.

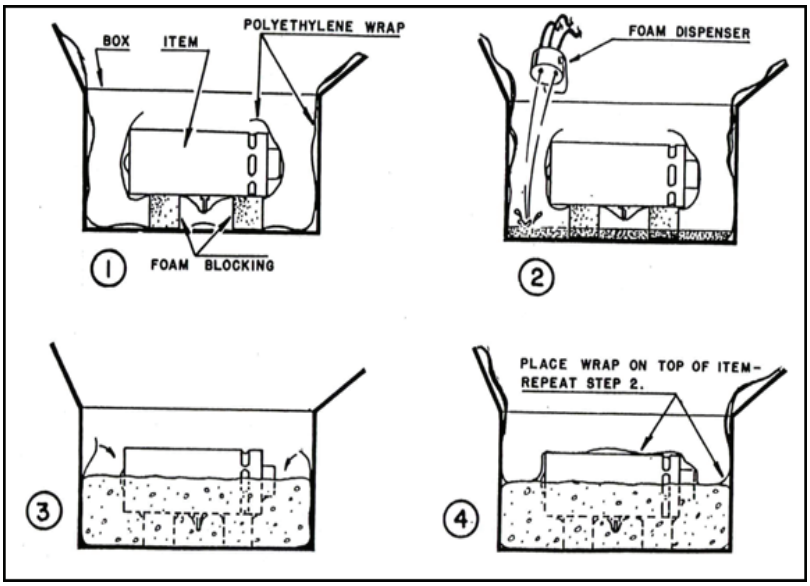
Basic Uses- FIP can be applied to a variety of items large and small; it eliminates the necessity for extensive packaging design, it's comparatively inexpensive and, most important, FIP affords very good protection for the item

MIL-HDBK-775 - Packaging Procedures for FIP provides instructions for the application of eight techniques of FIP. As with any other packing procedure, the item must be preserved by the proper method. Foam is provided in three classifications: flexible, semi-rigid, and rigid. To select the proper type, you must determine the weight of the item of which FIP technique you desire. All FIP packs are reusable if proper care is taken when opening and are stored properly in a clean dry area. Saving these packs, as with saving any other pack, can save a lot of time and money in packaging planning and packing.

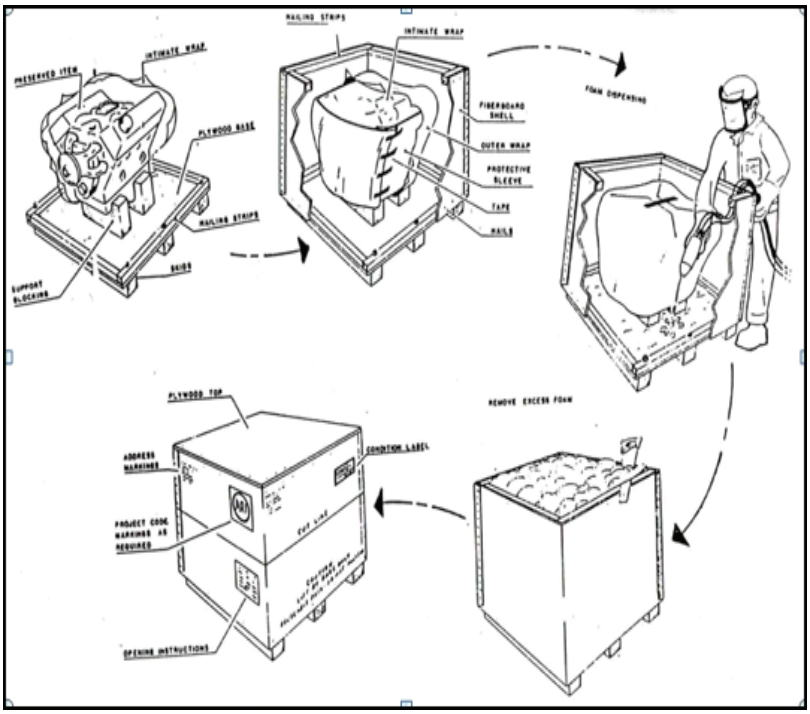
For items under 50 lbs



For items from 51 to 150 lbs

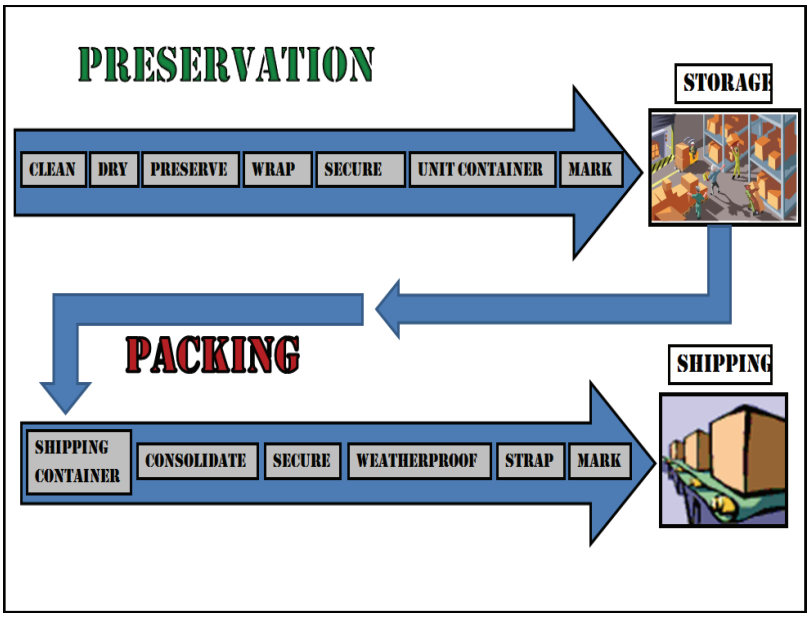


For Items from 51 to 150 lbs



The Packaging Cycle

Two different areas are affected in the packaging cycle: first, preserve for storage, and then second, package for shipment. Prior to storage, we are ensuring the item in question is properly cleaned and dried. Next, we ensure the correct preservatives are applied and the item is properly wrapped and secured. The next step is to unitize the item and ensure correct markings are annotated on the package for proper identification. After storing the item, it is now time to ship. The first step in preparing the item for shipping is to ensure that it is in the correct shipping container in accordance with MIL-STD-2073-1. Next, we want to load the unit container into a shipping container, if needed, secure the item, and mark according to MIL-STD-129.



Levels to Military Packing

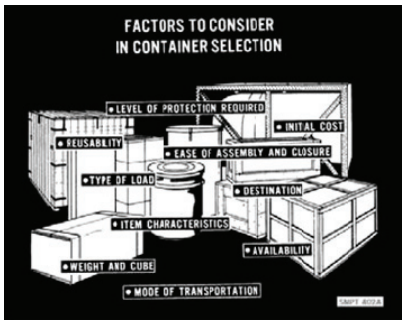
Military Packing is: Application of any exterior protective methods, materials, or devices to assure the integrity of the preserved item per MIL-STD-2073-1 as follows:

Level A– Most Severe Protection is required to meet the most severe worldwide shipment, handling, and storage conditions. A Level A pack must, in tandem with the applied method of preservation, be capable of protecting material from the effects of direct exposure to extremes of climate, terrain, and operational and transportation environments. Examples of situations which indicate a need for use of a Level A pack are: War Reserve Material, mobilization, strategic and theater deployment and employment, open storage, deck loading and Foreign Military Sales (as specified in the contract). Examples of containers used for Level A packing requirements include, but are not limited to, overseas type wood boxes, and plastic and metal reusable containers.

Level B– Moderate Protection is required to meet moderate worldwide shipment, handling, and storage conditions. A Level B pack must, in tandem with the applied preservation, be capable of protecting material not directly exposed to extremes of climate, terrain, and operational and transportation environments. Examples of situations which indicate a need for use of a Level B pack are: security assistance, such as Foreign Military Sales (as specified in the contract) and containerized overseas shipments. Examples of containers used for Level B packing requirements include, but are not limited to, domestic wood crates, weather-resistant fiberboard containers, fast pack containers, weather-resistant fiber drums, and weather-resistant paper and multi-wall shipping sacks.

Basically:

- **Select the right container**
- **Secure the item**
- **Select the correct closure**
- **Mark it**



Container Selection, Examples, Specs

NUMBER	TITLE
ASTM 5118/5118M	BOXES, SHIPPING, FIBERBOARD
ASTM-D 6039/6039M	BOXES, FIBERBOARD, CORRUGATED, TRIPLE WALL
ASTM-D7478/D7478M	CRATES, WOOD LUMBER AND PLYWOOD SHEATHED, NAILED, AND BOLTED (S/S by ASTM-D7478/D7478M)
ASTM-D 6251/D6251M	NATURAL WOOD-CLEATED PANELBOARD SHIPPING BOXES
PP-P-704	PAILS, METAL (SHIPPING, STEEL, 1 THROUGH 12 GALLONS)
PPP-B-1672	BOXES, SHIPPING, REUSABLE WITH CUSHIONING
PPP-B-585	BOXES, WOOD, WIREBOUND (Inactive for new design)
PPP-B-621	BOXES, WOOD, NAILED AND LOCK CORNER (S/S by ASTM-D6880)
PPP-D-705	DRUM, SHIPPING AND STORAGE, STEEL, 16 AND 30 GALLON CAPACITY
PPP-D-723	DRUM, FIBER (Inactive for new design)
PPP-D-729	DRUMS, SHIPPING AND STORAGE, STEEL, 55 GALLON (208 LITERS)
MIL-B-26195	BOXES, WOOD-CLEATED, SKIDDED, LOAD BEARING BASE (S/S by ASTM-D 6256/D6256M)
MIL-B-43666	BOXES SHIPPING CONSOLIDATION (Inactive for new design)
MIL-C-3774	CRATES, WOOD: OPEN 12,000 AND 16,000 POUND CAPACITY
MIL-D-6054	DRUM, METAL, SHIPPING AND STORAGE

Specifications	Description	Max Wt. Contents (pounds)	Level	Remarks
ASTM-D6039	Crates, Wood, Open and Covered	4,000	A, B	For size and weight restrictions, see ATSM-D6039
MIL-C-3774	Crates, Wood, Open TYPE I , TYPE II	12,000 ,16,000	A, B	Bolted or nailed assembly: size limitations: Type I- 16' x8 'x8' ; Type II- 40'x8x16'
ASTM-D7478	Crates, Wood: Lumber and Plywood Sheathed, Nailed	30,000	A, B	Size Limitations: 30'L x 9'Wx10'H (unless otherwise

Container Selection, Example, Specs (cont.)

When selecting a container for any item, you must first determine the item characteristics, or more simply put, determine whether the item will be protected from vibration, shock, or stacking forces during shipment, handling, and storage. Items are preserved to protect them from deterioration from the elements. The items are then packed in an intermediate/ shipping container for protection during handling. If either procedure is applied inadequately, the item stands a good chance of being damaged from corrosion or breakage.

Other factors to be considered are: how is the item being shipped and stored. Unit, intermediate, and shipping containers are in FEDLOG/ LIW for individual items by specification number. To describe or instruct you on the application of all the types of containers that are available is beyond the scope of this text. However, there should be enough info here to allow you to select the proper container. If your packaging operation is involved in ongoing packaging of specific types of items requiring certain types of containers, you should get the appropriate spec for that container. You usually end up with three choices, which are:

FIRST CHOICE - The same container that the new item was received in.

SECOND CHOICE - Any suitable container that is available that is not designated for any specific item other than the one being packed. Excellent choices are fast-packs and prefabricated boxes that are available through the GSA catalog.

THIRD CHOICE - FIP containers may be included in the first and second choices and should always be considered for all types of items, but are excellent for heavy/odd-shaped items. They are also reusable.

Remember, a good packaging operation should maintain a container reclamation and reusability program. Planning a pack can be a lot easier and save a lot of time if the materiel can be packaged in the same container that the new item was received in.

Long-life Reusable Containers (LLRC)

As per AR 700-15, Packaging of Materiel :

Selection and handling of LLRCs will be as follows:

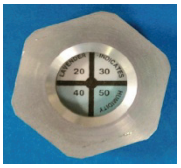
(1) When an LLRC is specified for an item, it is the only authorized method of packaging without specific deviation authorized by the integrated materiel manager (IMM) packaging office.
(2) When LLRCs are determined to be excess, the following will be accomplished:
    (a) At the installation/activity/depot level, notify the IMM of the item for which the container was designed. If the item IMM cannot be determined, contact the container IMM.
    (b) When the container is determined to be excess to the needs of the IMM, it will be referred to PSCC to determine if the container can be used to support any other packaging program. If PSCC determines no use for the container, the container IMM will be notified, and disposal of the container will be initiated.
(3) Best business practices for containers with humidity indicators is that they should be checked monthly.
(4) Questions, please don't hesitate to call LOGSA PSCC @ (570) 615-7105.

Humidity Indicators for LLRC

There are many types of humidity indicators that must be checked. The simple fact is that depending on the environment in which the LLRCs are going to be stored, they will have to be checked more or less frequently. We say this because a cyclic schedule should be followed. The two most basic types of humidity indicators are: reversible and non-reversible. If you have any questions, more specific guidance can be provided to you from LOGSA PSCC.

Color-Change (Reversible) Humidity Indicator Discs – includes "Single Spot Disc" and "Multiple spot/multiple section (pie) disc." The color-change disc turns from blue to lavender to pink as the humidity increases, and turns back to blue as the humidity decreases, which allows for the disc to be reused, as long as it has not turned white. A white disc indicates the humidity indicator has been exposed to excessive humidity and is no longer functioning and must be replaced.

Blue: Humidity level less than number indicated on disc/spot – GOOD
Lavender: Humidity level equal to number indicated on disc/spot – CAUTION
Pink: Humidity level surpassed the number indicated on disc/spot – BAD
White: Humidity Indicator not functioning – BAD

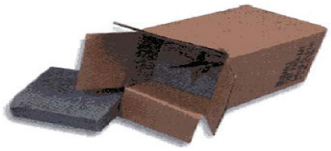


Non-reversible Delayed Response Maximum Humidity Indicator Discs. These discs contain a color-stain element which is irreversible; therefore, they should only be installed in a desiccated (dry) atmosphere. The disc, initially white, is stained orange when it has been exposed to 55% RH for an 8-hour continuous period or 85% RH for 2 hours. The disc will turn brown with continued exposure.

White: GOOD
Orange/Brown: Humidity level exceeded -BAD


Fast Packs-PPP-B-1672

Fast Packs are prefabricated cushioned containers. There are four types of fast-packs. Advantages are: reusability, cost, and simplicity of use. The most important advantage to using fast-packs is the excellent protection provided the item. These packs have a very wide range of application and are presently being used as unit containers.



Uses-

Items that should be shipped in fast-packs include delicate and fragile items that are susceptible to damage in shipment, especially electronic items and circuit cards that are vulnerable to ESD damage. Any item compatible in size and weight may be shipped in a fast pack. Overseas activities and continental United States (CONUS) installations will use the containers as often as possible for the shipment of items to depots or other activities. Although fast packs are identified as reusable containers, they are not accountable items. Each receiving activity should reuse the containers for the return of items and should not return any empty containers to shippers.

To help you in determining the type and size of fast-pack, you may need when planning a pack, the four types of fast packs are described below (these packs may be used for items weighing from 1 to 90 pounds and ranging in size from 2 to 25 ½ inches long):

Types:

TYPE I – Vertical Star Pack. For fragile and non-fragile items that are cylindrical or oblong in shape. Examples include meters, gauges, and indicators. Item maximum weight 23 lbs.
TYPE II – Folding Convoluted Pack. For circuit cards and other flat items. They are also available with antistatic cushioning for ESD packaging. Item maximum weight 10 lbs.
TYPE III – Telescoping Encapsulated Pack. For larger cube or rectangular-shaped items such as amplifiers and power supply units. Item maximum weight 90 lbs.
TYPE IV – Horizontal Star Pack. For larger or longer rectangular items such as voltage regulators, panels, transmitters, and amplifiers. Item maximum weight 31 lbs.

Closure and Sealing of Fast Packs

TYPE I, STYLE A packs shall be sealed with minimum 2-inch wide tape conforming to ASTM D 5486 (formerly PPP-T-60 and PPP-T-76) applied over all seams, corners, and manufacturer's joints. The tape shall be centered over the seams and joints and shall extend over all the corners and edges of the box a minimum of 2 inches onto the adjacent box panels. Tape shall be applied over the lengthwise seam of the outer flaps, sealing the opening of the box and over the manufacturer's joint prior to tape being applied to the edge seams of the box. The tape applied to the manufacturer's joint shall cover the joint but not extend over the corners of the box onto the adjacent panels. This method serves as the closure.

TYPE I, STYLES B and C packs shall have one band of 2-inch wide tape conforming to ASTM D 5330 (formerly PPP-T-97), type IV, fully encircle the pack. Sealing is not required.

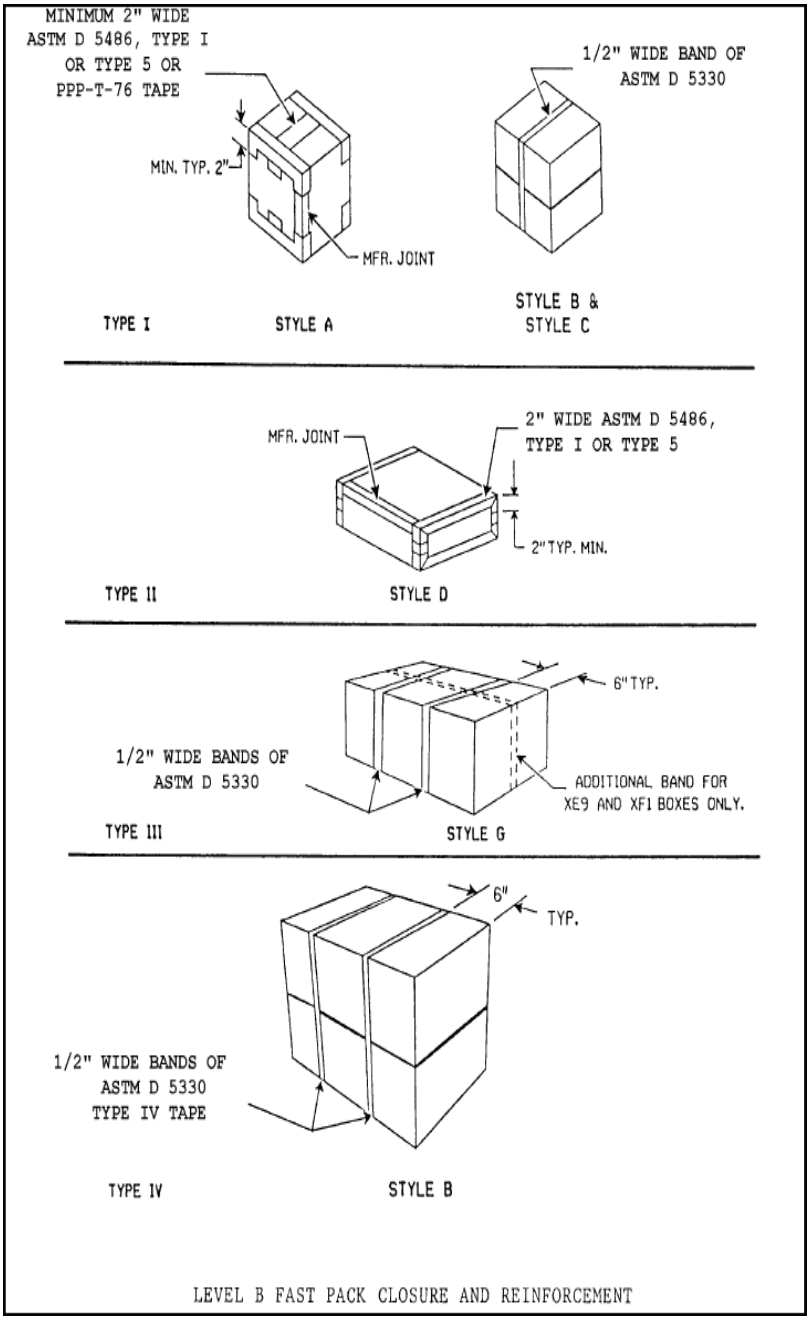
TYPE II, STYLE D packs shall be treated in the same manner specified for type I, style A containers, which is to seal all open seams and manufacturer's joint with 2-inch wide tape conforming to ASTM D 5486 (formerly PPP-T-60 and PPP-T-76), type III or IV. This method serves as the closure and seal.

TYPE III, STYLE G packs shall be sealed with bands of 2-inch wide tape conforming to ASTM D 5330 (formerly PPP-T-97), type IV. Two bands shall be positioned 6 inches from the ends over the top, bottom, and sides. Add one lengthwise band over the top, bottom, and ends for XE9 and XF1 Fast Packs. All bands will fully encircle the pack. Sealing is not required.

TYPE IV, STYLE B packs shall be sealed as specified for type III, style G, except that the lengthwise band shall not be applied. Sealing is not required.

Note: Level B packing is the highest level attainable in fiberboard containers, as compared with Level A in hard surfaced containers of wood, glass, metal, etc. Mark and label all containers IAW MIL STD 129.

Basic Views of Closures and Sealing



LEVEL B FAST PACK CLOSURE AND REINFORCEMENT

Let's Talk Closures/Reinforcement

CLOSURE is described as the procedure that is used to secure the opening of the container after the packing is accomplished. Box closures vary with practically every type and style of container. Closure requirements are spelled out in all of the container specifications. The most common containers used are ASTM 5118, ASTM-D 6251, PPP-B-621, ASTM-D7478/D7478M (Superseded MIL-C-104), MIL-B-3774, and MIL-B-26195. General instructions for closures for some of these boxes and crates are given herein.

***CAUTION -** When marking, closing, and reinforcing boxes, make sure that the markings and labels are not covered by strapping or closure tape.

CLOSURE FOR WOODEN BOXES
ASTM-D 6251 and PPP-B-621 are normally accomplished by simply nailing the lid onto the box. The lid for the cleated, plywood box, ASTM-D 6251 should be placed on the top with the cleats facing down. When the cleats are faced up, the pockets formed by the cleats trap water. Care must be taken to select the proper nail size. When nailing box tops into the side cleats, the requirement is 6 penny (6d) for 1-inch nominal lumber and 10 penny (10d) for 2-inch nominal. Nail placing should be 8 inches. When assembling or closing a wood box that has been previously used, never use the same nail holes - MAKE NEW ONES. When opening these boxes, use a NAIL PULLER, if available, to prevent splitting the wood. If a nail puller is not available, use a pry bar and pry the lid off carefully as not to break the cleats or plywood. Remove the nails and store the box if it is not to be used immediately.

BOXES AND CRATES WITH BOLT COLURES
Boxes and crates that are closed with bolts are usually closed at the bottom, keeping the top, ends, and sides assembled for easy removal and better access to the item. Lag bolts, FF-B-561, and washers, FF-W-92, are used for the assembling of the top and for closing. Style 1 Hex Head and Style 2 Square Head are both permissible, but Style 1 is more adaptable to common hand tools and is faster to install. The Grade C bolt is corrosion resistant and is also recommended, so the preferred bolt would be FF-B-561, STYLE 1, GRADE C. The length and diameter of the bold is determined by the size of the lumber that you are bolting into. Example, if you were assembling cleated plywood panels with 1-inch nominal cleats to a 4 by 4 nominal base, you should use bolts 3 inches long, and ½ inch in diameter. For bolting into the edge of 2-inch nominal lumber, you would use ¼-inch diameter bolts. Spacing should be about 12 inches apart. The corner bolt should be no less than 3 inches from the end.

When installing lag bolts, drill a starter hole for each bolt using a bit diameter slightly smaller than the bolt. This prevents splitting of the wood and allows for easier installation of the bolt. When installing bolts in previously used container, DO NOT use the existing holes - DRILL NEW ONES. Additionally, you should NEVER drive lag bolts into the wood with a hammer.

ASTM 5118/5118M Fiberboard box is the easiest and most common material. For closing fiberboard boxes, use 2-inch tape conforming to ASTM 5486/5486M. Closure is accomplished by taping completely over all box openings. Box openings will vary depending on the box style and openings may include the top and bottom, top only, bottom only, or the ends. Openings will also include the manufacturer's joint, staples, or stitching.

When opening boxes that are taped in this manner, DO NOT remove the tape. Removing of the tape will cause delamination of the fiberboard and damage the box. To open, cut along the opening with a shallow blade knife. To reseal, tape over the old tape.

REINFORCEMENT IS THE STRENGTHENING OF CONTAINERS

Fiberboard boxes, wood boxes, and crates require reinforcing when used as shipping containers. NOTE: Reinforcement (i.e., strapping) should only be done at the time of shipment. Specific requirements for individual types and styles of containers are called out in the specification for that container, but, generally, fiberboard boxes are reinforced with nonmetallic strapping and wood boxes, and crates are reinforced with metallic strapping. The metallic strapping must conform to ASTM-D3959, and nonmetallic strapping to ASTM-D3950. Although specified or permitted for specific operations, the application of metallic strapping for fiberboard boxes should be avoided. Reinforcing requirements are determined by the size and weight of the box. The size of the box determines the number of straps, and the weight determines the size of the strapping (see Figure 1).

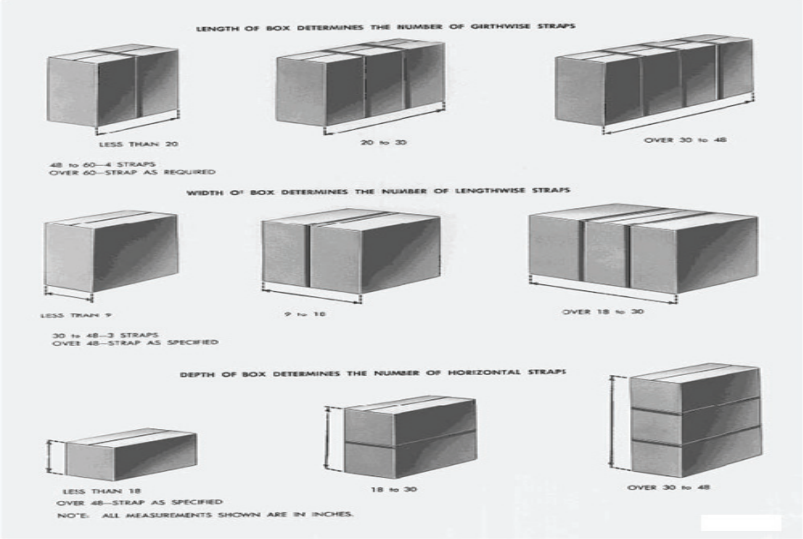


Figure 1

Marking and Labeling, MIL-STD-129

Marking and labeling requirements are specified in MIL-STD-129, which should be readily available to all packaging operations. Many packaged items are lost or shipments are frustrated because of illegible or inadequate markings. Marking and labeling requirements are the same for all military shipments, but their application may vary depending on the type of container and where or how it is being shipped. Common rules for marking and labeling include:

- Marking must be legible and contrasting
- Marking surface must be clean and dry
- Old markings must be obliterated
- Use approved marking materials

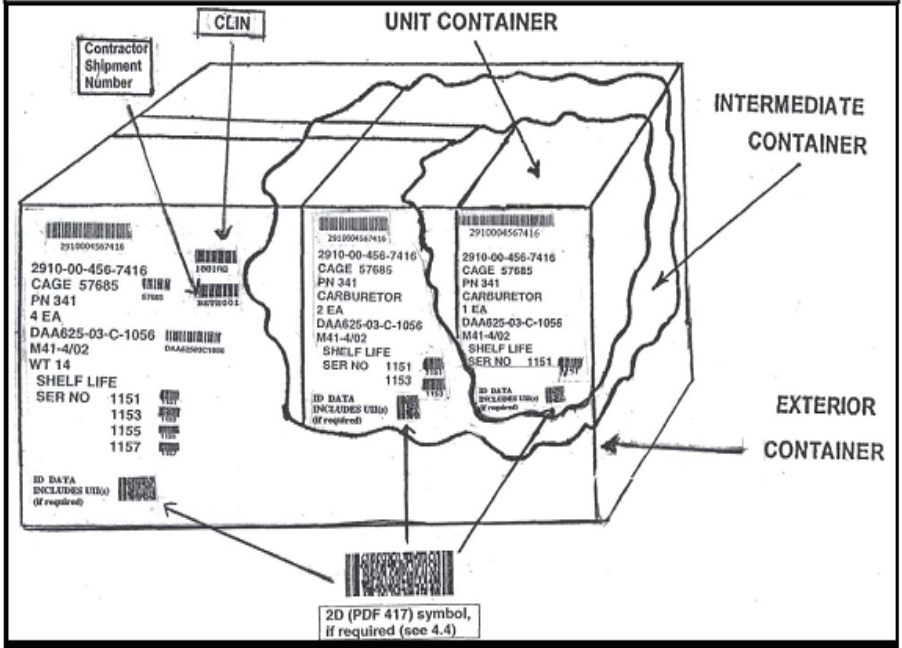
***CAUTION** - When marking, closing, and reinforcing boxes, make sure that the markings and labels are not covered by strapping or closure tape.

BASIC UNIT IDENTIFICATION LABEL

The marking surface of a unit pack shall be the outermost wrap, bag, or container of the unit pack.

Quick Guide to MIL-STD-129

Example of unit pack, intermediate, and exterior container identification markings
(including examples of bar code markings)



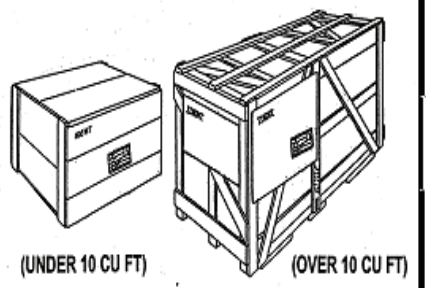
The following identification information shall be marked on all unit packs and intermediate containers, in the order listed. This requirement applies to all unit pack and intermediate containers repacked for shipment by military installations. Additional identification markings may be required by the contract and shall be placed either below these markings or in a conspicuous location on the identification-marked side of the container. Unit packs used as exterior containers at the time of packaging shall be marked in accordance with 4.1.2. of MIL-STD-129

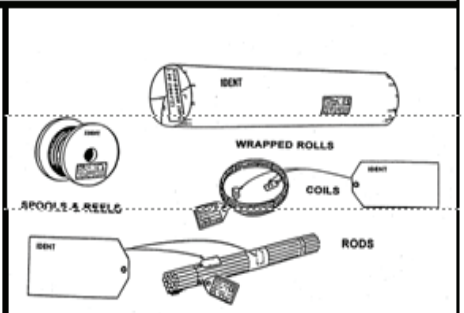
1. **NSN/NATO stock number.**
2. **CAGE code.**
3. **Part Number.**
4. **Item description or nomenclature.**
5. **Quantity and UI.**
6. **Military preservation method and date of unit preservation**
7. **Gross Weight capital letters "WT" shall precede the gross weight (Exterior Pack Only)**
8. **Shelf-life markings, if applicable, shall be applied as specified in 5.2.1.**
9. **Serial number(s).**
10. **Hazardous materials (HAZMAT) and ammunition and explosives marking (see 5.5 and 5.6).**

NOTE: The CLIN is not required by MIL-STD 129 for the Unit or Intermediate Container unless the Unit or Intermediate container is the Exterior container.

Quick Guide to MIL-STD-129 (continued)

Exterior Container Markings





Identification marking information on exterior containers and unpacked items
Unless specifically exempted in the contract or solicitation, the following minimum identification information shall be marked on all exterior containers and unpacked items, in the order listed.
Ammunition and explosives shall be marked as specified in 5.6. of MIL-STD 129 standard or as specified by the contract or solicitation. Hazardous items shall be marked with identification markings as specified herein and in 5.5. Bar code markings are required as specified in 4.4.

1. NSN/NATO stock number
2. CAGE code
3. Part number
4. Item description or nomenclature (for hazardous items and ammunition and explosives only
5. Quantity and UI
6. Contract number or purchase order number (PIIN) including four-digit delivery order or call number, modification for change order number, and lot number shall be shown
7. Military preservation method and date of unit preservation
8. Gross weight. The capital letters "WT" shall precede the gross weight.
9. Proper shipping name (PSN) and North American (NA) or United Nations (UN) identification number, where assigned
10. Shelf-life markings, if applicable
11. Serial number(s).
12. Hazardous materials (HAZMAT) and ammunition and explosives marking

Basic Shelf-Life Markings

Shelf-life markings shall be shown as part of the item identification data on unit packs, intermediate containers, exterior containers, and unpacked items. Shelf-life markings shall include the manufactured, cured, assembled or packed date (apply one date), and the expiration or inspect/test date, as appropriate.

SHELF- LIFE EXTENSION NOTICE

NSN: _____

CONTRACT NUMBER: _____

LOT/ BATCH NUMBER: _____

DATE TESTED: _____

NEXT INSP/ TEST DATE: _____

AUTHORITY: _____
(SSL, MDCSS, OTHER)

INSPECTED BY: _____
(ACTIVITY AND INSPECTOR'S NAME OR NUMBER)

For Type I shelf-life items: manufactured (MFD) date, cured date, assembled date, packed date (subsistence only) (apply one date, as appropriate), and expiration (EXP) date (see note). For items that contain rubber or synthetic elastomers, the expiration date shall be calculated from the cured date of the rubber/

For Type II shelf-life items: manufactured date, cured date, assembled date, packed date (subsistence only) (apply one date, as appropriate), and inspect/test (INSP/TEST) date (see note). For items that contain rubber or synthetic elastomers, the inspect/test date shall be calculated from the cured date of the rubber/ elastomer.

Quick Guide To Military Shipping Label (MSL)

FIGURE A. Generic Cargo.

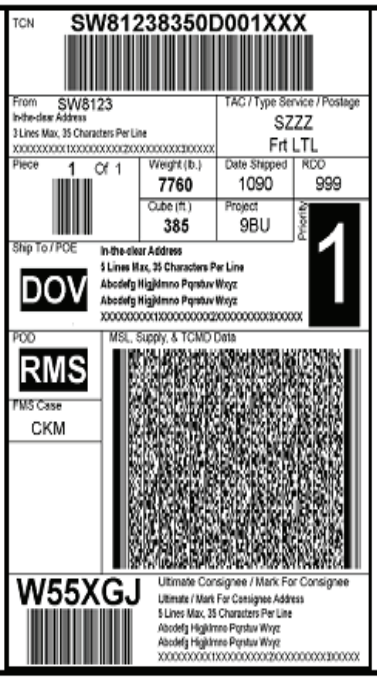


FIGURE B. Unit Move.

Military Shipping Label Markings consist of both human readable and barcoded information on a recommended 4x6 inch label. (MIL-STD 129, para 4.2.2.1).

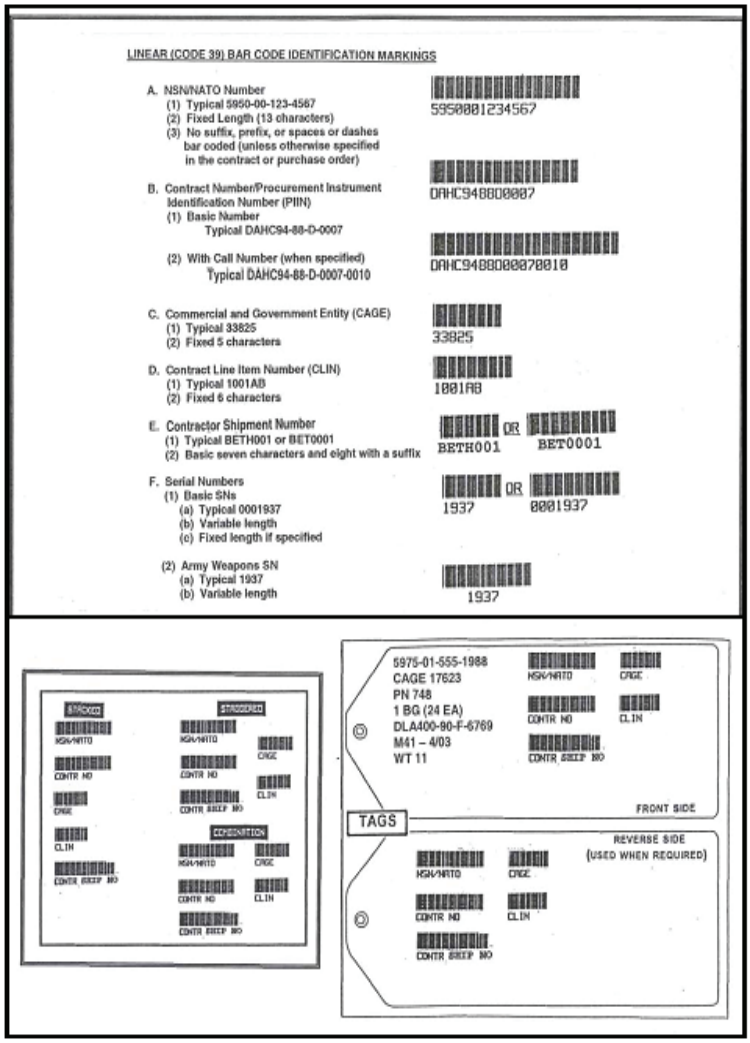
Basic Information needed on the MSL

1. Transportation Control Number (TCN)
2. Transportation Account Code (TAC)/Postage - in some cases this may be left blank
3. From - The consignor DODAAC/CAGE and address of the shipping activity
4. Type Service - The type of transportation service to the "ship to" address (such as Frt LTL, Air Expss, Expss Mail, etc.)
5. Ship to/POE - Ship-to address or, if applicable, the three-digit air/water Point of Embarkment (POE) code and its Ship-to address
6. Transportation Priority (1, 2, 3, or 4)
7. POD - air/water Point of Debarkment three-digit code, if applicable
8. Project code if applicable
9. Ultimate Consignee/Mark For Consignee DODAAC and address
10. Weight - Gross weight (lbs)
11. RDD - Required delivery date if specified by the requisitioner
12. Cube - Cubic feet rounded to the next whole digit
13. Date shipped
14. FMS (foreign military sales) case number, as appropriate
15. Piece Number - the piece number of the cargo documented by the TCN for this shipment unit
16. Total Pieces - Total number of pieces documented by the TCN for this shipment unit

Basic Information For Barcodes

- Code 39 linear barcodes (MIL-STD 129, para 4.2.2.b):
  1. Transportation Control Number (TCN),
  2. Piece number (Do not zero fill), and
  3. Ultimate Consignee/Mark For DoDAAC.
- 2D PDF417 symbology is required. See MIL-STD 129, para 4.2.2.6 and Table IV for details.

Examples of typical linear (Code 39) bar code fields.

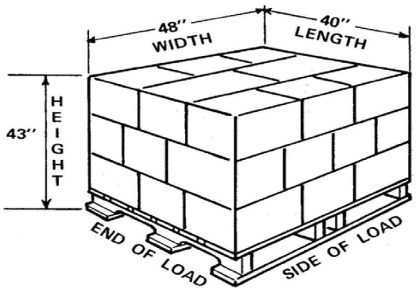


Unitization/Consolidation

Unitization is the grouping of like or unlike items for shipment kept together as a unit until the user receives the items. Advantages of unitizing loads are: eliminates laborious and expensive manual handling of individual items; reduces damage to items by eliminating manual handling; permits savings in handling costs; reduces personnel accidents by eliminating manual handling and lifting; simplifies inventorying and reduces inaccuracies; utilizes storage heights not possible by manual means; reduces pilferage because of unitization of items by steel straps and other bonding methods; permits faster movement of supplies and equipment; and reduces marking requirements on individual containers.

Please remember the Military Shipping Label (MSL) will be completed in accordance with 4.2.2.5 of MIL-STD-129 and attached in accordance with 4.3.2 of MIL-STD-129. Each shipment unit in a unitized load shall be marked with a MSL. For example, the shipment unit in a palletized unit load is the pallet (see page 65 for MSL).

Palletization-
Use the dimensions according to MIL-STD-147; the basic pallets will fit in most military shipping containers.



Wood Packaging Materials

Wood Packaging Material (WPM) Quick Reference Guide

Examples of WPM:
Wood pallets, boxes, crates, skids, load boards, cleats, reels, frames, and DUNNAGE

WPM does not include:
Material made wholly of manufactured wood products, such as furniture, plywood, particle board, and OSB. If the item has solid wood components, i.e., frame, skids, etc, it is WPM

International & DoD WPM Regulations

ISPM 15
"Regulation of Wood Packaging Material in International Trade"

DoD 4140.65-M
"Compliance for Defense Packaging: Phytosanitary Guidelines for Wood Packaging Material

WPM Affects the Entire Supply Chain & the Warfighters

Procurement
Cite WPM requirements in every DoD solicitation for goods, including local purchases

Receiving
Identify and report contractors and DoD activity that are not compliant. Prepare SF-364 Supply Discrepancy Report IAW AR 735-11-2

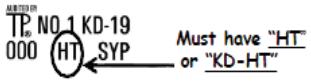
Shipping
If the WPM is not in compliance, the material shall not be offered for shipment. Inspect, treat, replace, or repack non-compliant WPM using the most economic solution

Transportation
Non-compliant WPM cannot enter the Defense Transportation System. In the event material is not in compliance, it shall be held (frustrated) until remediated

ISPM 15 Compliant WPM

- Must be made of debarked wood
- Must be treated (Heat or Methyl Bromide)
- Must bear approved IPPC certification mark

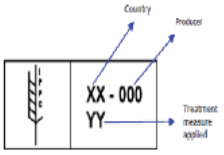
ALSC Heat Treated Lumber Marking



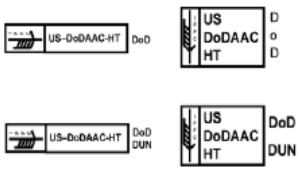
All WPM shall be constructed from lumber which has been heat treated to 56 degrees Centigrade (133 degrees Fahrenheit) for 30 continuous minutes. Compliant WPM should be stored at least 4 ft away from noncompliant materials.

The Mark

ISPM 15 Stamp Format



DoD Self-Certified WPM Stamp Formats



Application of the Mark

Apply in a visible location on at least 2 opposite sides, but not required on each individual component of WPM

On wooden pallets, the marking shall be applied to the stringer or block on opposite sides of the pallet and be clearly visible

On dunnage, the marking must be applied to opposite surfaces of each piece. If possible, the mark shall be visible to enable inspectors to verify the WPM's compliance without unloading

- Certification markings must be legible and permanent.
- They may be stamped, stenciled, or branded directly onto or into the WPM
- Do not use red or orange ink

DoD Pest Free Certification

The DoD "Pest Free" certification mark and process do not meet ISPM 15 guidelines

The Pest Free mark can only be used for existing WPM inventories that were not certified as heat-treated and are for:

- OCONUS retrograde shipments directly to CONUS
- Shipments to countries where there are no established host nation ISPM 15 programs
- Austere conditions

Existing WPM or dunnage may be certified as "Pest Free":

- If the WPM is bark free,
- Contains boreholes no larger than 3mm (or a 1/8" drill bit),
- There is no evidence of other insect infestation,
- And, if the pack date is less than 5 years (or unknown) and the moisture content is less than 20%

Follow marking application instructions on front page

Each requisition or document number is recorded as a single **INSTANCE**.

QUANTITY is the number of times the DoD Pest Free Certification mark is used for those instances

Requirements for Site Self-Certification

- Personnel are certified, taken online WPM training
- Site Custodian and Auditor appointed in writing
- Lumber Usage and Pest Free Certification Monthly reports are submitted by 15th of following month
- Initial/annual site audits performed using DA 7635
- Stamps are routinely inspected and secured
- Moisture meter to read moisture content of wood
- At least one ISPM #15 Certification Mark that is not to be used for dunnage
- An ISPM #15 Certification Mark that is to be used only for dunnage
- At least one DoD "Pest Free" Certification Mark

WPM Site Levels of Responsibility

Site Worker: Is a person located at the site who is a front-line worker within the packaging or WPM fabrication or shipping areas and is required to maintain daily hard-copy records. They apply the appropriate WPM certification marks and provide information to their Site Custodian or WPM Manager. They are not required to view or input records into the WPM Compliance Website.

Site Custodian: Is a trained person located at the Site within the packaging or WPM fabrication or shipping areas who controls the certification mark and maintains local lumber tracking records. The WPM Site commander or WPM Manager assigns this person and they must complete the on-line Lumber Usage Monthly Report and DoD Pest Free Certification Monthly Reports to ensure DoD compliance. This person oversees Site Workers, has overall responsibility for DoD compliance at sites within their command, ensures all required personnel have successfully completed the on-line WPM Certification Testing, has a copy of the training certificates, and ensures personnel re-take the training every 2 years.

Site Auditor: Is a trained, independent, and impartial person assigned by the WPM Site commander or WPM Manager who performs a WPM Audit on one or more sites to ensure procedures are being properly followed and records are in compliance with the DoD guidelines.

Training is located at: https://tarp.navsisa.navy.mil/wpm

**Access to the WPM website is based on the DoD PKI Certificate within your CAC.
Username and password to access the WPM website is not permitted.
You must re-register each time you receive a new CAC**

For WPM program assistance, contact LOGSAPSCC.wpm.TYAD@us.army.mil

Hazardous Materials (HAZMAT) Awareness

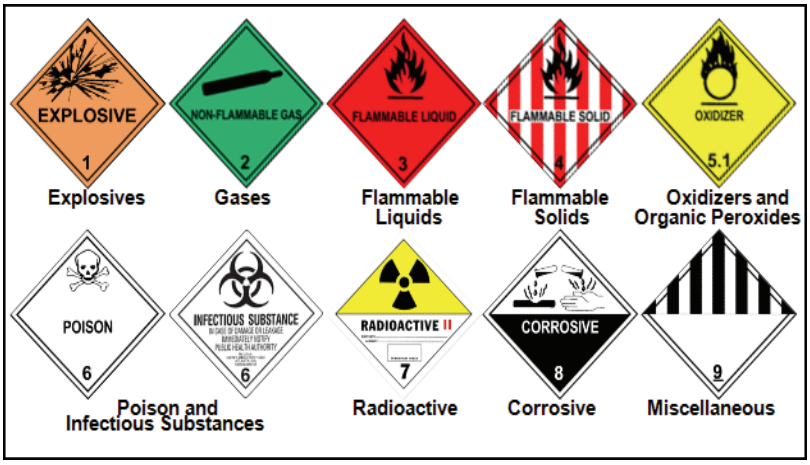
***ONLY AUTHORIZED PERSONS SHOULD HANDLE HAZMAT**

Training - No person will accept the responsibility of handling HAZMAT including, but not limited to, packaging, marking, labeling, etc., without first meeting the training requirements found in DoD 4500.9 -R, Defense Transportation Regulation (DTR, Part II, Cargo Movement, Chapter 204, Hazardous Material.

Transporting HAZMAT in a Government vehicle from Home Station to a Military Installation for additional unit processing and future movement aboard a vessel, a DD Form 836 must be completed for HAZMAT. If the unit's HAZMAT will be further transported on a vessel, a Multimode Dangerous Goods form must be completed for the unit's HAZMAT. If unit's HAZMAT will be going from Home Station directly to an OCONUS site by Government vehicle vessel, with no stops, only the Multimode Dangerous Goods form must be completed (see DTR). If HAZMAT will be shipped by air, commercial, or military, a Shippers Declaration for Dangerous Goods must be filled out for the movement of the unit's HAZMAT (see DTR).

Packaging of HAZMAT

HAZMAT CLASSIFICATIONS-- The proper classification of HAZMAT influences the packaging, hazard markings, shipping paper entries, emergency response, and any other instruction governing the material. It is, therefore, essential that the appropriate classification be made, as improper classification can be extremely dangerous.



HAZARD Classification System

The hazard class of dangerous goods is indicated either by its class (or division) number or name. Placards are used to identify the class or division of the HAZMAT. The hazard class or division number must be displayed in the lower corner of a placard, and is required for both primary and subsidiary hazard classes and divisions, if applicable. For other than Class 7 or the OXYGEN placard, text indicating a hazard (for example, "CORROSIVE") is not required. Text is shown only in the US. The hazard class or division number and subsidiary hazard classes or division numbers placed in parentheses (when applicable) must appear on the shipping document after each proper shipping name.

Class 1 - Explosives

- Division 1.1 Explosives with a mass explosion hazard
- Division 1.2 Explosives with a projection hazard
- Division 1.3 Explosives with predominantly a fire hazard
- Division 1.4 Explosives with no significant blast hazard
- Division 1.5 Very insensitive explosives with a mass explosion hazard
- Division 1.6 Extremely insensitive articles

Class 2 - Gases

- Division 2.1 Flammable gases
- Division 2.2 Non-flammable, non-toxic* gases
- Division 2.3 Toxic* gases

Class 3 - Flammable Liquids (and Combustible Liquids [U.S.])

Class 4 - Flammable Solids; Spontaneously Combustible Materials; and Dangerous When Wet Materials/Water-Reactive Substances

- Division 4.1 Flammable solids
- Division 4.2 Spontaneously combustible materials
- Division 4.3 Water-reactive substances/dangerous when wet materials

Class 5 - Oxidizing Substances and Organic Peroxides

- Division 5.1 Oxidizing substances
- Division 5.2 Organic peroxides

Class 6 - Toxic* Substances and Infectious Substances

- Division 6.1 Toxic* substances
- Division 6.2 Infectious substances

Class 7 - Radioactive Materials

Class 8 - Corrosive Substances

Class 9 - Miscellaneous Hazardous Materials/Products, Substances or Organisms

* The words "poison" or "poisonous" are synonymous with the word "toxic."

Check the Shelf-life!

Shelf-life (SL) is the total period of time beginning with the date of manufacture, cure, assembly, or pack (subsistence only) that an item may remain in the combined wholesale (including manufacturer's) and retail storage systems, and still remain usable for issue/consumption by the end user.

Each item that meets the SL criteria is assigned a NSN and a specific SL code. Typical SL items include food, medicines, batteries, paints, sealants, adhesives, film, tires, chemicals, packaged petroleum products, hoses/belts, mission-critical o-rings, and nuclear/biological/chemical equipment and clothing.

The SL code identifies the SL time period by which an item must be used or subjected to inspection/test/restoration or disposal action. These codes are identified in Appendix A of the DoD 4140.27-M, Shelf-life Management Manual, and consist of two types, Type I and Type II. Type I is an individual item of supply which is determined through an evaluation of technical test data/actual experience to be an item with a definite non-extendible period of SL and ends with the expiration date. Type II is an individual item of supply having an assigned SL time period that may be extended after completion of inspection, test, or restorative action and is identified by an inspection/test/date.

The policies for optimizing SL materiel are contained in DoD 4140.27-M , as authorized by DoD Directive 4140.1, Materiel Management Policy. This policy provides for the supply chain (life-cycle management) of standard and hazardous SL items contained in the federal supply system.

MILITARY SERVICE AND AGENCY ADMINISTRATORS FOR THE DoD SHELF-LIFE PROGRAM

SERVICE/AGENCY	EMAIL
DoD	SLES.DOD@dla.mil
DLA	SLES.DLA@dla.mil
ARMY	SLES.ARMY@dla.mil
NAVY	SLES.NAVY@dla.mil
AIR FORCE	SLES.AirForce@dla.mil
MARINE CORPS	SLES.Marine@dla.mil
DTRA	SLES.DTRA@dla.mil
GSA	SLES.GSA@dla.mil
FAA	SLES.FAA@dla.mil
USCG	SLES.USCG@dla.mil
DCMA	SLES.DCMA@dla.mil
DLIS	SLES.DLIS@dla.mil

SHELF-LIFE CODES

			Required Number of Months/Quarters Remaining Upon Receipt by the first Government activity	
Shelf-Life Period	Type I	Type II	Months	Quarters
Non-Deteriorative No Shelf-Life Applies	0 (zero)	0 (zero)	N/A	N/A
01 Month	A	N/A	25 days	N/A
02 Months	B	N/A	50 days	N/A
03 Months	C	1	75 days	N/A
04 Months	D	N/A	3	1
05 Months	E	N/A	4	1
06 Months	F	2	5	2
09 Months	G	3	8	3
12 Months (1.00-Year)	H	4	10	3
15 Months (1.25-Years)	J	N/A	13	4
18 Months (1.50-Years)	K	5	15	5
21 Months (1.75-Years)	L	N/A	18	6
24 Months (2.00-Years)	M	6	21	7
27 Months (2.25-Years)	N	N/A	23	8
30 Months (2.50-Years)	P	N/A	26	9
36 Months (3.00-Years)	Q	7	31	10
48 Months (4.00-Years)	R	8	41	14
60 Months (5.00-Years)	S	9	51	17
72 Months (6.00-Years)	I	N/A	61	20
84 Months (7.00-Years)	T	N/A	71	24
96 Months (8.00-Years)	U	N/A	82	27
Variable such as: 90, 132, 216, 228, etc. Months or any other number of months not specifically assigned.	V	N/A	77, 113, 184, 194, etc.	26, 38, 61, 65, etc.
120 Months (10-Years)	W	N/A	102	34
180 Months (15-Years)	Y	N/A	153	51
240 Months (20-Years)	Z	N/A	204	68
Shelf-Life Period Greater than 60 Months for Type II Extendible Items.	N/A	X	85 percent of number of months	85 percent of number of quarters

Effects of Corrosion

What is Corrosion? ***Corrosion*** can be defined as the destructive attack on a metal through interaction with its environment.

Stages of corrosion	Description	Painted surfaces	Exterior machine surface (functional and nonfunctional)	Interior machine surface (functional and nonfunctional	Remarks
I	Discoloration staining; no direct visual evidence of pitting, or other surface damage.	This condition does not require immediate corrective action.	This condition does not require immediate action other than reprocessing as necessary	This condition does not require immediate action other than reprocessing as necessary	Use as is, except in the case of elevating cylinders subjected to functional wiping action. Remove corrosion using crocus cloth
II	Loose rust, black or white corrosion accompanied by minor etching, and pitting of surface. No scale or tight rust.	Clean by any applicable process. Touch up with paint as originally applied.	Clean, exercise, and reprocess	Clean, exercise, and reprocess.	In the case of elevating cylinders subjected to functional wiping action, remove corrosion by use of crocus cloth.
III	Rust, black or white corrosion accompanied singularly or in - combination with etching, pitting, or - more extensive surface damage. Loose or granular condition.	Clean by any applicable process. Touch up with paint as originally applied.	Clean, exercise, and reprocess	Exercise and reprocess	This condition would have minor effect on fit or wear of paint or component but would permit use without reprocess. Does not apply to such items as instruments (electrical or manual) and critical surfaces that are necessary to effect a seal against pressurized liquids.
IV	Rust, black or white corrosion progressed to the point where fit. wear, function life of the item have been affected. Powdered or scaly condition with pits or irregular areas of material removed from surface of item.	Clean by any applicable process. Touch up with paint as originally applied.	Replace or rework parts and components involved.	Replace or rework and components involved.	This condition will require action as indicated.

Supply Discrepancy Report (SDR)

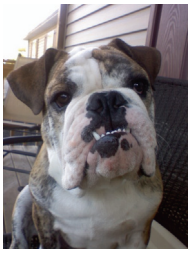
What is an SDR?

The purpose of preparing SDRs is to determine the cause of discrepancies, effect corrective action, and prevent recurrence. Such reports provide support for adjustment of property and financial inventory accounting records; information as a basis for claims against contractors; notification to shippers; visibility of preservation, packing, marking, and unitization discrepancies; required corrective actions; disposition instructions; and information for management evaluations.

The following are typical packaging discrepancies reported on Packaging Supply Discrepancy Reports (SDR). Consider these typical packaging discrepancies as tips for inspecting incoming products and to report any deviations or omissions.

PRESERVATION	PACKING	MARKING
Preservation inadequate	Container inadequate	Wrong National Stock Number (NSN)
Item is corroded	Closure inadequate	Wrong item description
Material contaminated	Strapping inadequate	Wrong quantity marked on unit container
Cushioning inadequate	Cushioning inadequate	Wrong Unit of Issue
Non-specification materials used	Blocking inadequate	Method/Date of packaging incorrect/omitted
Excessive preservation	Skids omitted	Contract Number incorrect/omitted
Quantity within Unit Container incorrect	Excessive packing	ESD symbol, label or marking incorrect/omitted
		RFID tag missing or incorrectly labeled (P311-P317)

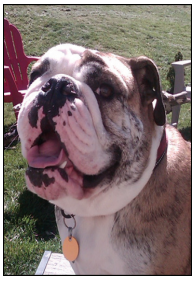
Retrograde (Deployment and Re-Deployment) Packaging "Not That Simple"



Retrograde packaging planning begins upon arrival and unpacking. One of the unit's advanced party members, usually "SGT Ace" Supply NCO (may be a bit new in the rotation), should have been assigned the responsibility for maintaining the packing containers that can be reused for return. In addition to the assigned task, you need to compare the items and quantities on-hand in the pre-deployment property book versus on-hand for redeployment. This establishes a baseline for items lost or destroyed in the deployment theater versus items lost in transit during redeployment.

All the different methods of preservation and packaging must be adhered to when thinking about retrograde. Not only are you going home, but most of those items you have been using will too, and we don't want any "extra" stowaways. Once a listing has been developed of items and supplies on-hand and their retrograde status, each item being returned to a CONUS site will have to be cleaned, washed, and inspected to the requirements of the United States Department of Agriculture (USDA). If possible, the unit should seek the cleaning, packing, and crating services of the Theater Retrograde Processing Site. Personnel from this site would probably have portable dry-air compressors, steam cleaners, barrier and cushioning materials, and other packaging materials and equipment.

Once each item is cleaned and inspected for packaging, these packers with heat-sealable barrier material and portable heat-sealers could fabricate bags to enclose and protect each item from contamination. Retrograde materiel placed in a container for return processing must be placed on a packing list denoting each item, quantity, and weight. Each item packed in the container should also be marked with the items NSN, nomenclature, quantity, and packed weight. The Container Packing Certificate and other retrograde/customs processing papers should also be enclosed in container packing list envelopes. The Armed Forces Pest Management Board (AFPMB) has a website that has Technical Information Memorandums (TIMs) (e.g., TIM #24 and #31) and other guidelines that can be downloaded and reviewed for item retrograde processing, including vehicles. http://www.afpmb.org . So good luck, from a more mature SGT Ace.



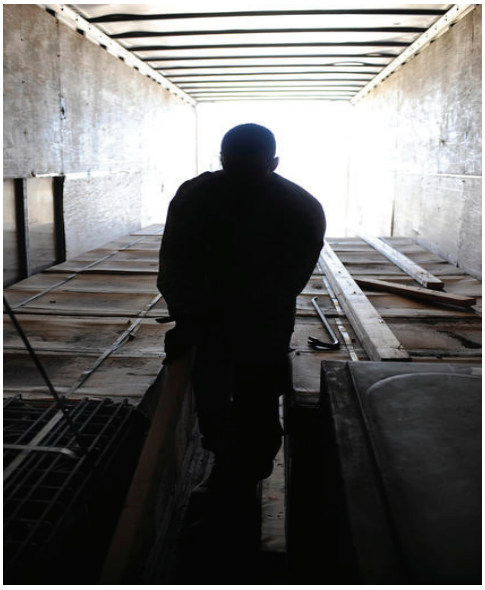
Blocking and Bracing

Blocking and Bracing is the application of wood, plywood, or mechanical devices to prevent movement of the skidded load or movement of the skid within the carrier. Blocking and bracing for shipment is also referred to as external blocking.

Cargo, or items to be shipped, are placed in containers. These must be secured to withstand the most stringent transportation modes to which it will be subjected during multimodal shipment. For example, containerized cargo/equipment can be moved through any one or any combination of highway, rail, air, and ocean modes. Therefore, it must be secured to withstand the most severe load conditions to which it will be exposed.

Container contents may be subjected to sudden jolts during transport. Containers loaded on rail cars must withstand the impact, up to 8 MPH, resulting from coupling the rail cars together in the rail yard. Twenty-foot containers picked-up with palletized load system (PLS) trucks will be tilted to approximately a 35-degree angle during the loading process. All containers are subject to varying G forces during transit.

It is a shipper's responsibility to ensure that cargo is secured to withstand any combination of these situations. Shippers are either commercial vendors, DoD Depots or Supply Activities, or, in the case of unit equipment, the Unit.



Blocking & Bracing (cont.)

The shipper's main responsibility is ensuring that the cargo stuffed inside a container arrives undamaged. Lumber, pallets, and banding material is used to keep the load from shifting (for more information, see TM 38-230, Volume 2). When stuffing containers, shippers should do the following:

- Distribute the weight of the cargo evenly over the floor of the container.
- Place heavy cargo on the bottom of the container and lighter cargo on top.
- Block and brace the cargo to prevent movement in any direction.
- Fill in the voids between the cargo and the container sides.
- Ensure all liquids are packaged in appropriate containers.
- Use block stowage to protect bagged cargo from shifting.
- Keep the center balance of the cargo as near as possible to the center of the container. If this is not possible, mark the center balance on the container and notify the carrier.
- Never exceed the weight limitations of the container.
- Close and seal container doors carefully. Put serial numbered seals on the container to detect pilferage and tampering.
- Place one copy of the packing list inside and one outside the door.
- Weigh containers before shipment at the origin and record the weight.
- Observe procedures for hazardous cargo.

Lumber must be kiln dried/ heat treated per WPM regulations.

ARMY GREEN

It has been said “America's professional warriors and army civilians are marching in step with environmentalists and conservationists, and green is rapidly becoming the "in" color, not just for the Army but throughout the U.S. military.”

Sustainability reporting is not a short-term or one-time effort; this annual synopsis informs the Army’s primary stakeholders, the American people, and other interested parties on its progress in embodying the principles of sustainability in operations, installations, systems, and community engagements. The Army’s continuing contingency operations make some trend reporting difficult, as deployments consume huge amounts of resources. The figure below presents several trends and highlights from 2008.

- **21 Army installations have undergone an integrated strategic and sustainability planning process as of December 2008.**
- **100% of Fiscal Year 2008 (FY08) Army new military construction projects are required to be designed at 30% more energy efficient than the ANSI/ASHRAE/IESNA 90.1-2004 standards.**
- **In 2008 all new Army construction was required to be designed to achieve a LEED®2 Silver rating.**

  - 1.4% increase in facility water use since FY07, 30.6% reduction since FY04
  - 2.3% decrease in facility energy use intensity since FY07, 10.4% decrease since FY03
  - 70% increase in hazardous waste disposal and a 48% increase in pounds of hazardous waste disposed per $1,000 net Army cost of operations over Calendar Years (CY) 06–07
  - 8% decrease in absolute toxic release inventory (TRI) releases, and a 14.3% decrease in pounds TRI released per $1,000 net Army cost of operations over CY06–07

Basic Safety Rules

Ten Basic Safety Rules

1. Follow instructions; do not take chances or short cuts; if you do not know, ASK.

2. Correct or report unsafe conditions.

3. Help keep the job site clean and orderly.

4. Use the right tools and equipment for the job.

5. Report all injuries immediately to your superior no matter how minor. Obtain first aid treatment, if necessary.

6. Use, adjust, and repair equipment only when authorized.

7. Use personal protective equipment; wear safe clothing; keep items in good condition. This is a must with safety glasses and gloves.

8. No horseplay. Avoid distracting others.

9. When lifting, bend your knees. Get help for heavy loads.

10. Comply with all safety rules and signs.

REMEMBER: DO IT THE SAFE WAY!

Contacts, Support, & Training

LOGSA PSCC:

PSCC General E-mail -
toby.pt@us.army.mil

Wood Packaging Material (WPM) Program -
logsapscc.wpm.tyad@us.army.mil

Army Shelf-life -
https://www.shelflife.hq.dla.mil/

Army Stock Readiness Program -
logsapscc.sr.tyad@us.army.mil

LOGSA PSCC (Packaging POC Booklet, Cross Reference Document) -
https://www.logsa.army.mil/pscc

Training websites:

DAC - http://ammo.okstate.edu

WPM- https://tarp.navsisa.navy.mil/wpm

Shelf-life -

Army POC – (570) 615-7685, DSN 795-7685
Website - https://headquarters.dla.mil/j-3/shelflife/ (CAC enabled) or www.shelflife.hq.dla.mil (public)
Training: TARP website modules: see below
DAU: SL CBT "Continuous Learning Modules" (https://learn.dau.mil/html/clc/Clc1.jsp?cl)
CLL 120- Introduction to the DoD Shelf-life Program
CLL 121- Acquisition and Procurement
CLL 122- SLES for Public Users - Internet
CLL 123- SLES for Public Users - Intranet
CLL 124- SLES for Admin Users - Internet
CLL 125- SLES for Admin Users - Intranet
CLL 126- Integrated Materiel Management (IMM)
CLL 127- Receiving, Storage Surveillance, & Extensions Pt. 1
CLL 128- Receiving, Storage Surveillance, & Extensions Pt. 2
CLL 129- Requisitions, Issue, & Shipment
CLL 130- Materiel Disposition

Packaging, DVD source-

http://www.defenseimagery.mil/imagery.html
A search for packaging at this website produces a number of products that can be ordered free of charge. Although these items may be somewhat out-of-date and do not take the place of formal training, it is suggested that DOL order these items for the packaging area. You can order "10" at a time. If you need help, call LOGSA PSCC @ (570) 615-7105.

Army Corrosion Web Site- http://armycorrosion.com

TACOM (Rock Island B14 & Warren AKZ)-
https://www-tdps.tacom.army.mil/PACQSearch.asp

DSCC DLA NMWP FREQUENTLY ASKED QUESTIONS-
www.dscc.dla.mil/offices/packaging/nmwpmnotice.html

For technical and equipment publications - (TMs, TBs, MWOs, Los, SCs, and some SBs) except for engineering and medical -
https://www.logsa.army.mil

Department of Transportation (DOT) - The Office of Hazardous Materials Safety, which is within the United States DOT's Research and Special Programs Administration, is responsible for coordinating a national safety program for the transportation of hazardous materials by air, rail, highway, and water -
http://phmsa.dot.gov/hazmat

Other Aids-
For administrative departmental publications and forms (ARs, Cirs, Pams, Ofs, SFs, DD & DA Forms)-
http://www.apd.army.mil

For doctrinal and training publications (FMs PBs, TCs & STPs) except engineering & medical-
http://armypubs.army.mil/

For all engineering publications (except administrative):
http://www.usace.army.mil/usace-docs

For all medical publications (except administrative):
http://www.armymedicine.army.mil

DA FORMS-
http://www.apd.army.mil/USAPA_PUB_formrange_f.asp

DD FORMS-
http://www.dtic.mil/whs/directives/infomgt/forms/formsprogram.htm

Logistics Information Warehouse (LIW) -
Fill out an application to log in. Once there, in the left column, go to: Catalog- System-Packaging Requirements = SPIs-
https://liw.logsa.army.mil/index.cfm?fuseaction=login.main

MILITARY PACKAGING SCHOOL

Military Packaging School
Defense Ammunition Center
McAlester, OK
http://ammo.okstate.edu.

- PACK-1A-DL - Computer-based web training to gain the necessary knowledge and terminology to attend Pack 1B. Available on-line. Anyone with a Common Access Card (CAC) and an AKO account can register for this course.

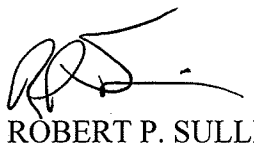
  In order to register for PACK-1A-DL, you must go through AKO, click on the Self Service tab, click on the My Training tab, and sign up in ATARRS. If you use the Advanced Search option and click on the school drawdown menu, you will see Defense Ammunition Center. Click on it. That will give you an alphabet list of the courses by course name. Midway down the first page, look for PACK 1A-DL and select it by clicking on the register link. Fill out the forms that come up. In 24 hours, you will be notified of your enrollment.

- PACK-1B - A hands-on, performance-based training in basic and intermediate military preservation, packaging, and unitization procedures.

  - Length: 80 hours (two weeks)
  - Prerequisites: Successful completion of PACK-1A-DL

  This is a full two-week course at McAlester, OK.

The proponent agency of this pamphlet is the USAMC Logistics Support Activity, Packaging, Storage, and Containerization Center (PSCC). Users are invited to send comments to Chief, US Army Materiel Command, Logistics Support Activity, Packaging, Storage, and Containerization Center, ATTN: AMXLS-AT, Tobyhanna, PA 18466-5097 or e-mail toby.pt@us.army.mil. The electronic version can be viewed and printed from the LOGSA website at https://www.logsa.army.mil/pubs/Pam746-1.pdf



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